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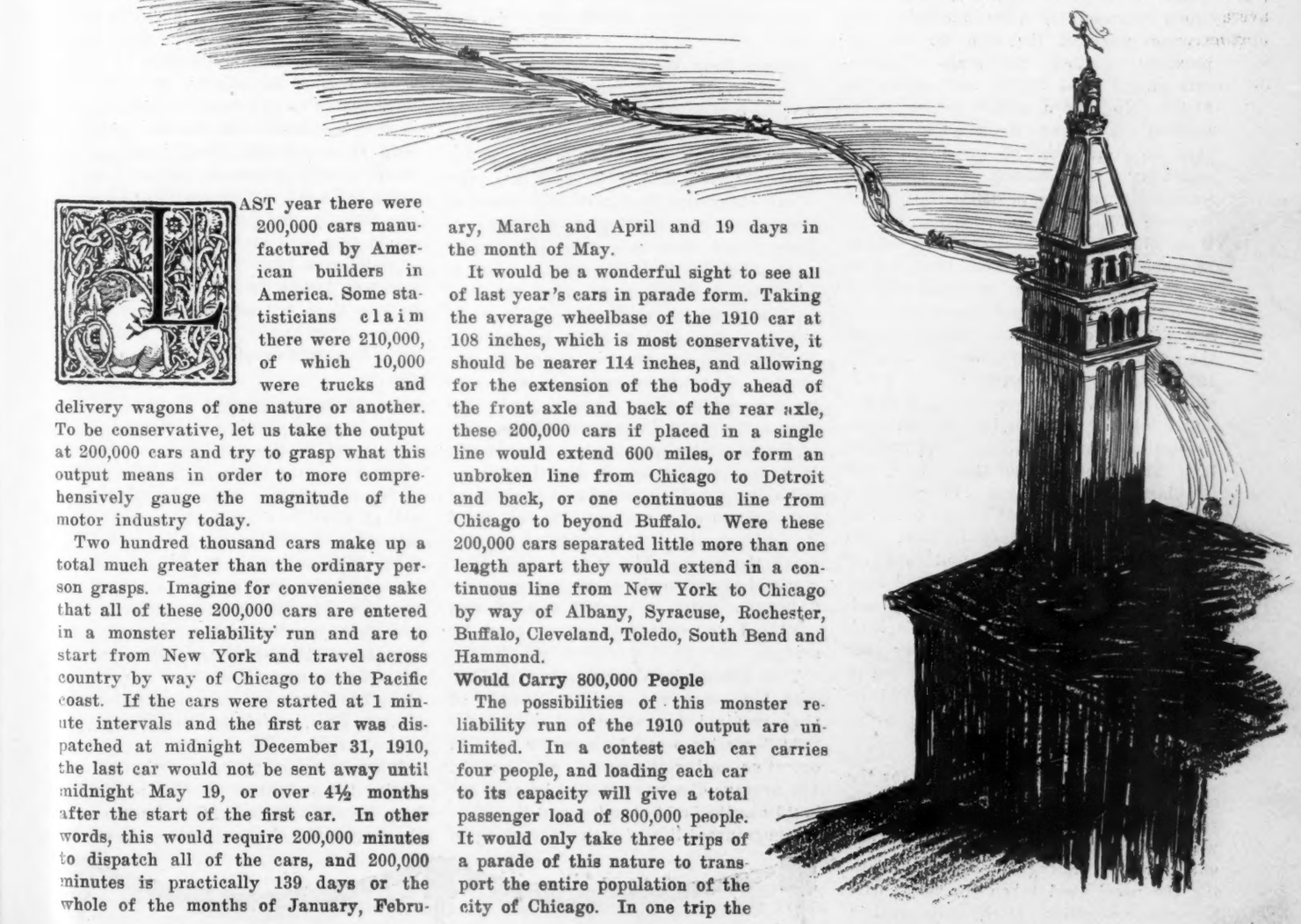
MOTOR AGE

JUST SUPPOSING

Statistician figures out what it would be possible to do with America's 1910 output of motor cars. If the 200,000 cars were started in a coast-to-coast reliability it would take 139 days to get all of them under way. Such a caravan would transport 800,000 people, the entire population of Detroit or Cleveland, and travel 121,000,000,000 in a year Total cost of the cars would reach the gigantic sum of $300,000,000.



LAST year there were 200,000 cars manufactured by American builders in America. Some statisticians claim there were 210,000, of which 10,000 were trucks and delivery wagons of one nature or another. To be conservative, let us take the output at 200,000 cars and try to grasp what this output means in order to more comprehensively gauge the magnitude of the motor industry today.

Two hundred thousand cars make up a total much greater than the ordinary person grasps. Imagine for convenience sake that all of these 200,000 cars are entered in a monster reliability run and are to start from New York and travel across country by way of Chicago to the Pacific coast. If the cars were started at 1 minute intervals and the first car was dispatched at midnight December 31, 1910, the last car would not be sent away until midnight May 19, or over 4½ months after the start of the first car. In other words, this would require 200,000 minutes to dispatch all of the cars, and 200,000 minutes is practically 139 days or the whole of the months of January, February, March and April and 19 days in the month of May.

It would be a wonderful sight to see all of last year's cars in parade form. Taking the average wheelbase of the 1910 car at 108 inches, which is most conservative, it should be nearer 114 inches, and allowing for the extension of the body ahead of the front axle and back of the rear axle, these 200,000 cars if placed in a single line would extend 600 miles, or form an unbroken line from Chicago to Detroit and back, or one continuous line from Chicago to beyond Buffalo. Were these 200,000 cars separated little more than one length apart they would extend in a continuous line from New York to Chicago by way of Albany, Syracuse, Rochester, Buffalo, Cleveland, Toledo, South Bend and Hammond.

Would Carry 800,000 People

The possibilities of this monster reliability run of the 1910 output are unlimited. In a contest each car carries four people, and loading each car to its capacity will give a total passenger load of 800,000 people. It would only take three trips of a parade of this nature to transport the entire population of the city of Chicago. In one trip the

IF THE 200,000 CARS SOLD IN 1910 WERE TO BE PAID FOR IN SILVER DOLLARS THE TOTAL NUMBER, IF LAID SIDE BY SIDE, WOULD FORM A SIDEWALK 3 FEET WIDE AND EXTENDING FROM CHICAGO TO DETROIT, A DISTANCE OF 300 MILES

parade would carry every man, woman and child in the city of Cleveland; and transporting the population of Detroit at one time would be but a pleasure outing for it.

The physical possibilities of an output of 200,000 cars per year is but one phase of this great problem. There are others which, to the financial statistician, would prove immeasurably more interesting. The average price of the 1910 car was approximately $1,500. One corps of estimators placed it at $1,531, and another at $1,450. To take a middle course, let us suppose the average figure to be $1,500; then the total cost of the 1910 output amounts to $300,000,000. If these cars were to be paid for in dollar bills, which measure 7¼ inches in length, and if these bills were to be placed end to end in ribbon form, they would have a total length of 34,327 miles, or would make a ribbon that would extend almost 1½ times around the world at the equator. While the amount of money required to buy the 1910 output appears greatest from a volume point of view, when estimated in one dollar bills, it does not lose its enormous proportions when considered in silver dollars. The silver dollar of today is 1½-inch in diameter and weighs 26.7 grammes. There are 28.35 grammes to the ounce, so that its weight is scarcely 1 ounce. The money required for the output in silver dollars would make a total of 8,780 tons. It would take 300 of the present-day railroad freight cars to transport this load. All told ten solid trains of thirty cars each to carry alone the money required in silver dollars for the output would be needed.

Sidewalk of Silver Dollars

Were the silver dollars required for the entire 1910 output placed side by side forming a sidewalk 3 feet wide, this sidewalk would have a total length of 296 miles, or from Chicago to Detroit, following the usual road taken by motor cars between these cities. If the entire cost in silver dollars were to be carried on 3-ton motor trucks, each truck carrying its complete load, it would call for a total of 2,926 trucks to transport the output; or this amount of money would practically make up the entire load carrying-capacity for one load each of all the big commercial delivery wagons and trucks built by American manufacturers during the year just closed.

Distance They Would Travel

The grand aggregate distance that 200,000 cars will travel in a year is almost incredible when first considered. It is conservative to state that the average distance per car will be 5,000 miles in a year. Many companies that have kept track of the mileage of a great many of their cars have found that the average is nearer 7,000 to 9,000. Placing the average at 5,000 miles, there is a grand total of 1,000,000,000 miles covered in the 12 months. One billion miles is equal to 40,000 trips around the world at the equator. If all this distance were covered by one car it would have to make 109 trips a day around the world at the point of its greatest circumference. To do this it would be necessary to travel 2,725,000 miles every day, or to drive at the rate of over 113,000 miles an hour. At this speed it would require but a couple of days to reach the moon. The sun, a much more remote body from the earth, being distant 93,000,000 miles, it would require this combined motor speed 34 days to reach its surface.

Tire upkeep is always a big problem with the car owner, and the number of tires required for an annual output for 200,000 machines and to keep the same in operation during the year is considerable. The average distance traveled by each car in 12 months is 5,000 miles, and the average guaranteed life of a tire, according to the adjustment period, 3,500 miles, then it would be conservative to estimate that each car requires a set and a quarter of tires per year. Giving each car its set of four tires makes altogether 800,000 tires, and adding the quarter set for each adds an additional 200,000 tires, making a total of 1,000,000 tires a year needed. These tires will approximate 4 inches in casing diameter each, and if they were placed side by side they would form a rubber tube 63 miles in length. If these tires were placed in the same relative position as the front wheel is to the rear wheel but with their circumferences touching they would form a continuous line of tires 568 miles in length. Were each casing cut in two radially, and placed end to end, they would form one continuous rubber trough slightly over 1,800 miles in length, or of sufficient length to extend from Chicago to New York and return. Were the inner tubes placed end to end they would form an endless rubber tube extending the same distance.

3,000,000 Casings Needed

But these figures on the tire situation only apply to the 200,000 cars manufactured during the last year, and have to be increased threefold when the annual output of tires is considered, because it is estimated there are in use in America today 600,000 cars. All of these cars are in commission and consequently call for tires, so that the complete output of the tire factories for last year must have approximated 3,000,000 casings to meet the demands for cars alone. One tire concern alone has announced that it manufactured 500,000 tires, which is one-sixth of the entire output of the country.

When it comes to the question of estimating the amount of gasoline required to keep 600,000 cars in operation for a year, the magnitude of the figures are as great

if not greater than those in any other phase of this motor car estimation. The 600,000 cars, averaging 5,000 miles each per year, will travel a total of 3,000,000,000 miles. It is a reasonable estimate to make that a car will average 15 miles to the gallon, and on this basis 200,000,000 gallons of gasoline are needed each year for this number of cars. The average retail price of gasoline throughout the country will be 20 cents, making a total outlay for fuel alone of $40,000,000.

This sum is small when the amount of service that is obtained is considered. The average car carries four people, and it travels 15 miles on a gallon, so that the work done is equivalent to carrying one person 60 miles on each gallon of gasoline. It costs 20 cents a gallon, so that the gasoline expense last year per-person-mile amounted to one-third of a cent, or at the rate of 3 miles for a cent, a remarkably low figure.

Big Gasoline Tank

The space occupied by the gasoline consumed by these 600,000 cars in 1 year is no small one, and if a tank of sufficient capacity to hold it were to be built, it would not be a small one. For convenience, suppose that a tank 85 feet long and 75 feet wide were used. These measurements are the same as the dimensions of the famous Metropolitan tower in New York. A tank with these dimensions would have to be 4,193 feet high, or almost three-quarters of a mile, in order to accommodate this amount of gasoline. These figures are based on the assumption that each gallon occupies 231 cubic inches of space. Were this gasoline to be carried in a cylindrical ank, having a diameter of 100 feet, it would be 3,400 feet in height.

But the magnitude of the motor industry is barely touched upon in this brief analysis of a few phases of it. To properly gauge its strength is almost an impossibility. Efforts have been made to obtain the complete capitalization of all the companies manufacturing cars. This is impossible, because some refuse to give the facts and others are constantly in the process of increasing the capital and reorganizing the company. There are companies today which are capitalized for over $10,000,000, and engaged solely in the manufacture of cars. In the busy season of last year some concerns employed as high as 6,000 people, that is, half an ordinary city engaged in the building of cars at one factory alone.

Benefits of the Industry

The building of factories in certain cities has already resulted in more than doubling their population, and where one factory has settled smaller ones have sprung up around it so that small cities have become important manufacturing centers.

So great has the industry become that there are today over 8,500 dealers in the different cities and towns throughout the country making a living by the selling of motor cars. In addition to this number and more than 1,000 others engaged in the selling of cars, but who are without sales rooms, doing as it were a curbstone business, and selling largely by personal solicitation.

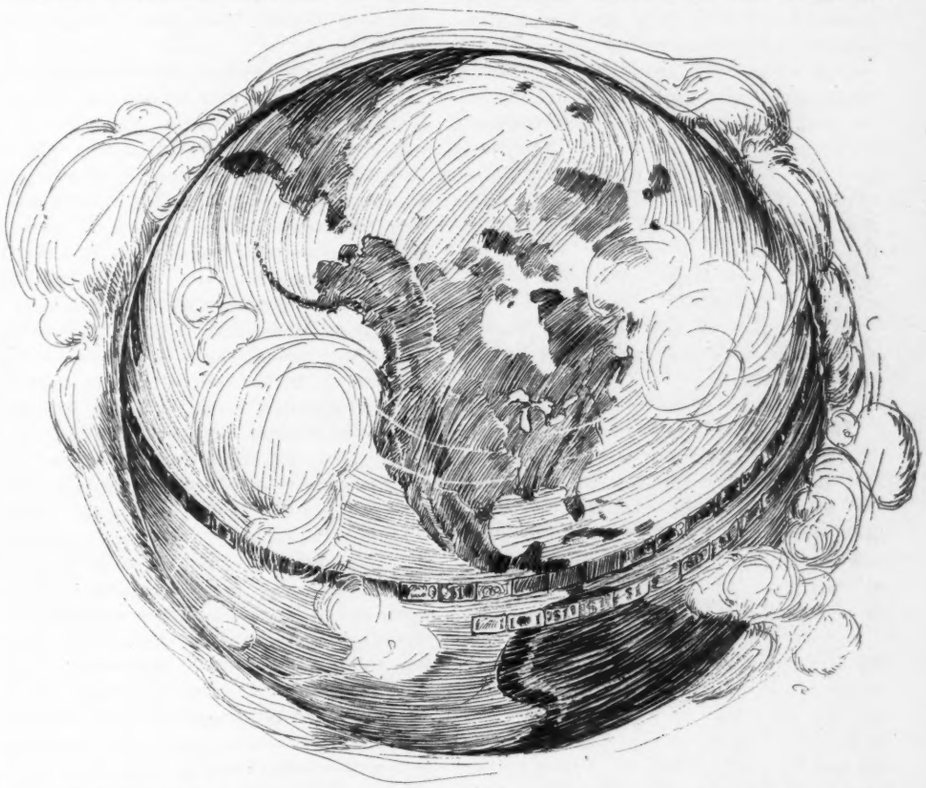
Chicago's Retail Mart

Perhaps in no other city has the retail business of selling motor cars and accessories reached such proportions as in Chicago, where Michigan boulevard from Twelfth to Twenty-sixth street has been transformed from a residential section into a business locality because of the motor industry. Miles of three-story stone fronts have been torn down and the large three and four-story glass front salesrooms put up in their place. It has entirely revolutionized real estate values and has had the most important bearing on the adjacent portions of the city.

There is no other factor that is today doing more to remove congestion in the cities than the motor car. By it boulevard streets have been in sections adjacent to the business quarters changed into high-class business zones, not by the actual selling of cars or building salesrooms but by the improved transportation facilities afforded by the car. The best business houses are today seeking locations on the streets that are free from trolley cars and heavy freight, and it invariably happens that the best streets that are free from the trolley are those that are most used by motor cars and generally are the thoroughfares that lead into the best residential districts. It is along these channels that one of the greatest missions of the motor car in the city life is being accomplished.

It is problematical with many what the product of cars for 1911 will be and also what it will be for succeeding years. Roughly speaking the 1911 output will not be any greater than the 1910 one was. Many concerns which set out to build several hundred more cars than they did a year ago already have curtailed and cancelled orders on parts so that their output will be several hundred cars under that of last year. As far back as August 1, 1910, some big makers saw the turn affairs were taking and at once cut down their orders on parts and cut down the factory force. What some concerns did then others did later, so that in all probability the 1911 output will range around the 180,000 mark.

The demand at recent shows has been for the medium-priced car. This is, however, a seasonable demand as buyers of high-powered cars generally place their orders early in the season, whereas those investing in the medium-priced car generally wait until the backbone of winter is broken and the symptoms of warm spring days exhibit themselves. The demand for cars will be good for the next few months, and then the 1912 work will start.



IF ALL OF THE 200,000 CARS PURCHASED IN 1910 WERE TO BE PAID FOR IN $1 BILLS AND THESE BILLS WERE TO BE SEWED TOGETHER END TO END IN RIBBON STYLE THEY WOULD MAKE A BAND THAT WOULD ENCIRCLE THE EARTH ONE AND ONE-HALF TIMES AT THE EQUATOR.

Chalfant Thomas Company's President

Packard Sales Manager Resigns to Become Head of Reorganized Buffalo Concern, Taking With Him Three of His Former Associates—Rumor $10,000,000 Backing Has Been Secured

DETROIT, MICH., Feb. 15—Special telegram—E. P. Chalfant, sales manager of the Packard Motor Car Co., has resigned his position to take the presidency of a reorganization of the E. R. Thomas Motor Co., of Buffalo. Along with Mr. Chalfant go three other former officials of the Packard company. These are Purchasing Agent F. R. Humpage, Assistant Purchasing Agent Albert L. Lovely and Auditor John J. Ramsay. Mr. Humpage will be the general manager of the Thomas company, Lovely and Ramsay will be department heads of the reorganized company. Mr. Humpage is at present in Buffalo, while Mr. Chalfant expects to leave Saturday.

It is announced informally here that a large sum of money, said to be $10,000,000, has been secured by the Thomas company from Eugene Meyers & Co., the New York bankers. This will be used in the development of the Thomas company's business under the direction of Mr. Chalfant. Mr. Chalfant's new position is said to promise a very large salary and a percentage of the profits.

No successor to the departing department heads have been announced by the Packard company.

TRADE ACTIVITY IN DETROIT

Detroit, Mich., Feb. 13—Expansion is still the order of the day in the industry of Detroit, the past week having been remarkable for the announcement of new corporations of motor car and parts builders, and for the acquisition of increased facilities of those already existing.

The formal organization of the King Motor Car Co. is announced. The capitalization given is $500,000, of which $250,000 has been paid in. The company will manufacture the King car—the product of the ingenuity of Charles B. King, a prominent local designer who was at one time chief engineer of the Northern Motor Car Co. The car will be equipped with a 30-horsepower motor, said to contain but 450 parts. The first year's output will be limited, but the management has large plans for the future. H. Kirke White is president. He is a well-known Detroit banker. The other officers are: Vice-president, Charles B. King; secretary-treasurer, E. C. Hough, of Plymouth, Mich. Announcement of the formation of this company was delayed for several months pending a recovery of the plans of the car which, it is alleged, had been stolen and were recovered by the company only by process of law.

The Chief Motor Co. is another concern which will market a pronounced novelty, according to its present plans. A V-shaped motor of eight cylinders, two in each chamber and remarkably light, are characteristic features. The company has two cars building at a temporary factory.

The Gray-Hawley Mfg. Co., which has been manufacturing brass goods on Fort street west, has purchased a site on the north side of Jefferson avenue, between McDougall and Elmwood avenues, and has broken ground for a two-story factory. The company has large contracts with several of the Detroit manufacturers whom it will be able to supply more easily from the new location and with the enlarged facilities.

The Detroit Pressed Steel Products Co. has completed the foundations for its new building at 1800 Mount Elliott avenue, corner of the Belt Line tracks, and has plans laid for a greatly enlarged output of frames and axles. The ponderous equipment necessary to this branch of manufacture is one which has made it one of the specialties in which few motor car manufacturers have seen fit to indulge. The capital stock of the company has been increased from $60,000 to $200,000. H. E. Bodman, E. B. Kalkins, J. Walter Drake, R. F. Flinterman, Hobart B. Hoyt and K. B. White comprise the new board of directors. Allen H. Zacharias is president.

The Fisher Body Co. is moving its equipment into its new building, adjacent to its old plant, Piquette and St. Antoine streets. The building is of five stories, brick and steel construction, and affords ample floor space for its designed purpose—the manufacture of closed bodies. Up to date this has been a department of manufacture which the body concerns in Detroit have avoided, wherever possible. Those Detroit factories which have found it impossible to secure enough room to finish their own coupe and limousine bodies have been purchasing them from carriage plants in other cities as a rule. The Fisher people believe that they will find as ready a demand for their new product as for the open style bodies which they have been making in the past. The new factory will be operated under the name of the Fisher Closed Body Co., but is practically a branch of the established concern, its officers and stockholders being the same with the exception of J. T. Allmand, who will act as vice-president and shop manager.

The Warren Motor Car Co. has accepted plans for the doubling of its factory building along the Michigan Central and Lake Shore tracks in the northern portion of the city and work will be begun as soon as the frost is out of the ground. The Warren company has plenty of ground for expansion and originally purchased a site which was planned to be covered by three buildings of similar size and construction. It is believed that the third building will be started as soon as the second is completed. The Warren unit, represented by the factory which now houses the company, is of brick and steel, two stories in height, and 68 by 178 feet in size. The second building will be used for the testing, repair and forge departments of the company.

CROXTON MOVING TO CLEVELAND

Cleveland, O., Feb. 13—The Croxton Motor Co., formerly the Croxton-Keeton Motor Car Co., of Massillon, O., which has reorganized under the state laws of Ohio, with a capitalization of $250,000, has bought the old Baker motor vehicle plant at 2260 East Sixty-ninth street and will move to Cleveland. It will manufacture from 200 to 600 taxicabs and motor trucks, giving employment on start to 200 men. H. A. Croxton is president and general manager; J. P. Stoltz, vice-president and eastern sales manager, and H. D. Michaels, of New York, secretary and treasurer. H. A. Croxton and H. D. Michael will remove at once to Cleveland, getting the plant started. Mr. Croxton has closed out all his other interests and will devote his entire time and attention to the taxicab company.

DEATH OF IRVIN ROBBINS

Indianapolis, Ind., Feb. 13—Following an illness of about 3 weeks, Irvin Robbins, president of Irvin Robbins & Co., died at his home in this city last Wednesday. Mr. Robbins was 71 years old, but until a short time prior to his death was actively engaged in business. The company at which Mr. Robbins was at the head manufactures motor car bodies, limousine and coupes being made a specialty. The company was organized 35 years ago to manufacture carriages, but a few years ago the manufacture of carriages was discontinued and motor car bodies were made.

MAIS COMPANY REORGANIZED

Indianapolis, Ind., Feb. 13—The Mais Motor Truck Co. has recently moved from Peru to Indianapolis and a reorganization of the concern has been perfected. A large factory has been leased at the C., H. and D. and belt railway tracks, where several hundred men are now employed. The officers of the reorganized concern are: President, Charles A. Bookwalter, former mayor; vice-president and chief engineer, A. F. Mais, designer of the truck; secretary and treasurer, A. W. Markham, president of the Indianapolis Motor Car Co.; general manager, E. J. Robison, form-

Now It Is the Studebaker Corporation

Charter is Granted in New Jersey for a Concern Capitalized at $45,000,000 To Purchase Assets of Studebaker Mfg. Co., at South Bend and Detroit—Property to be Paid for in Stock

NEW YORK, Feb. 14—The Studebaker Corporation, with an authorized capital of $45,000,000, was incorporated in the office of the secretary of state of New Jersey today. The corporation is formed to purchase the property and assets of the Studebaker Mfg. Co., of South Bend, Ind., a concern devoted to the manufacture of carriages, wagons and motor cars, and the E-M-F Co., a motor car maker at Detroit.

The purchase involves the acquisition of $7,447,253 in cash. The property purchased is to be paid for in stock of the Studebaker Corporation of the par value of $43,498,000, of which $13,500,000 is to be preferred stock bearing 7 per cent cumulative dividends and $29,998,000 of common stock.

The property purchased does not include certain excepted holdings of the two absorbed companies. Among the excepted properties are dwellings, stores and a theater in South Bend and property at Twentieth street and Wabash avenue, Chicago.

The capital stock of the new concern is divided into $15,000,000 preferred with 7 per cent cumulative dividends and $30,000,000 common.

er county treasurer; plant manager, J. L. Davidson, and sales manager, Charles Fisher. Others interested in the concern are Hugh J. McGowan, president of the Indianapolis Traction and Terminal Co.; Rudolph G. Leeds, editor of the Indianapolis Sun and editor of the Richmond Palladium; John T. Saulter, broker; W. M. Pearce, Dr. E. A. Sterne and W. H. Roberts, former county commissioner.

STANDARD SIX REVIVED

St. Louis, Mo., Feb. 13—At a recent meeting of the St. Louis Car Co., manufacturer of the Standard Six, it was announced that the company has paid off its indebtedness and has a working capital of $400,000. It is believed that the motor car department, which has been closed for several months, will be reopened in a short time. These officers and directors elected are: President, John I. Beggs, succeeding George J. Kobusch; chairman board of directors, George J. Kobusch; secretary-treasurer, J. M. Taylor; assistant to the president, Edward Messmer. The office of the vice-president has not been filled. The directors are: Robert McCullough, Richard McCullough, John I. Beggs, Edward Meissmer, George J. Kobusch and Warber McCall.

JERSEY STILL ANTAGONISTIC

New York, Feb. 11—The New Jersey legislature again has gone on record as being opposed to granting privileges to visiting motorists, the senate having rejected the reciprocity bill which would have permitted the non-resident to enter New Jersey and travel there for 15 days in any 1 year without registering his car and without taking out a driver's license. It also provided that it would be unnecessary to file a power of attorney with the secretary of state, as is now required as the means of proceeding against him in case of violation of the statute. The bill was defeated in the senate by a vote of eleven to eight. It is proposed by the motorists to bring the measure up later in the session and also efforts are being made to put a similar bill through the assembly.

DETROIT TRADESMAN KILLED

Detroit, Feb. 14—Harry Niederlander, president and general manager of the Niederlander Motor Sales Co., Michigan distributor of the Haynes, was instantly killed at an early hour this morning, when his car skidded and crashed into a telephone pole out Jefferson avenue near the plant of the Chalmers Motor Co. Several other members of the party were badly shaken up and the car was wrecked. Niederlander formerly was in charge of the local sales of the Brush runabout and Hupmobile. He was 35 years of age and unmarried.

DETROIT TESTS NEW CARS

Detroit, Mich., Feb. 13—It is a noticeable fact that, in no past season have there been on the streets of this city so many experimental models from the various factories, as there are at present. It now is freely recognized that new cars must receive a thorough test to ensure success when placed in the hands of their owners. The result is seen in the many hybrid cars which testers are driving daily. As a rule, an attempt is made to make the car appear as nearly like a regular model as possible but the skilled observer often will note the existence of rear axles of curious design, and hoods that are padlocked to prevent the intrusion of curious eyes. This spring the number of experimental trucks and delivery wagons is especially noticeable. It seems generally admitted that the great change of the industry's near future will be in the demand for motor trucks and delivery wagons. Manufacturers who now market pleasure cars exclusively are working on commercial styles now. In addition, there are many experimental models of private designers which are being tried out.

A pronounced feature of the present season is the improved shipping facilities which are being afforded by the railroads which run into Detroit. This is undoubtedly due to the increased number of motor cars now at the disposal of the various roads, as well as to the intelligent work which has been accomplished by the transportation bureau of the Detroit board of commerce. The latter organization has made a careful study of the conditions which exist and, after tracing a large number of shipments, has compiled a table which gives the approximate time between the departure of a shipment from Detroit and its arrival at its destination. The railroads have participated and have improved the service in many respects. In addition, their freight departments have been very considerate of the motor interests in making up special trains to visit the shows and make the transfer from one exhibition to another—an operation which, in former years, has been entrusted exclusively to the express companies.

CARTERCAR MEN BANQUET

Detroit, Mich., Feb. 13—George A. Palmer, general manager of the Cartercar Co., was the host Saturday evening of a banquet tendered the foremen and department heads of the Cartercar Co., of Pontiac, the affair being held at Ardussi's, along the line of the Detroit-Pontiac interurban. Thomas Neal, the newly-chosen president of the General Motors, was one of the guests of honor.

Mr. Neal, speaking for the General Motors Co., said: "All local managers of our different companies will not be disturbed in the future by financial matters. These will all be handled by a central organization in Detroit. Every factory will only be required to produce. We have now arranged for the best worked-out engineering laboratory that this country can produce. This laboratory will not replace the local engineering department now in operation at the different factories. It will merely be an auxiliary and act in an advisory capacity. There will also be one general purchasing department, which will be able to obtain the best quality because of the immense quantities which this department will be in position to purchase. These are just a few of the reorganization plans that we have in mind for the immediate future of the General Motors Co."

FINDLAY CARRIAGE CO. IN TROUBLE

Findlay, O., Feb. 13—The Findlay Carriage Co., Saturday, went into the hands of a receiver, W. A. McCaughey being appointed by the court. Within the past year the company has branched out in the manufacture of motor cars, making the Findlay 40, and it is supposed that this precipitated the receivership. The suit is a friendly one, and it is supposed the company will pull out of its difficulties.

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The Fore-Door Body

MANY manufacturers are expending some energy at the present time wondering what will be the success of the fore-door body when the warm weather comes. They expect that it will be too hot, and that in summer seasons it will be necessary to remove the front doors in order to get desirable ventilation. A few makers have anticipated this situation by attaching demountable doors which, when removed for summer use, a beading strip attached, the body will have as complete an appearance without the door as with it.

IT is questionable, however, if many owners of fore-door cars will want to remove the door in the summer time, because it is a cleanly feature that cannot be overlooked. Those who have ridden in surrey-type vehicles without the side door for the rear seat, or in the roadster with the single or double rumble, are familiar with the way in which the dust is drawn in around the ends of the front seats. This condition occurs at the front seat to a lesser degree.

THE fore-door is one of the acknowledged body improvements that is bound to stay; and, if it is not in the estimation of everybody beneficial the year round, its overwhelming advantages in the winter season more than offset some disadvantages for the summer. It is an easy matter to ventilate, if necessary. One or two concerns have already done so by using screened openings in the front of the dash. One or two others have attached deflectors along the top of the dash, which deflectors are merely curved pieces that direct the air down behind the dash. With the motorcar traveling at 20 to 30 miles per hour, there never can be much real difficulty in the matter of ventilation, and the means of ventilating are so numerous that it might always be considered a waste of time, and certainly a breach of good business to fail to introduce the fore-door solely because of the ventilating problem for summer seasons.

FORE-DOOR cars were used last year on the Glidden tour and traveled through Texas and other southern states without the front seat passengers suffering because of the heat. There are cars in which the proximity of the exhaust pipe beneath the footboards will cause the heating of them, but this has already been corrected by the use of asbestos beneath the floor boards and also around the exhaust manifold. If the heat of the motor comes through the dash, there is room enough to use asbestos over the front of the dash. The use of this material for this same purpose is old, and there is no reason the motor car should not adopt it in a place of this nature.

THE popularity of the fore-door body to date practically assures its continuance. It has practically driven out the torpedo type, which was considered by some a factor a year ago but which is now looked upon to take its place along with the rumble seat roadster, which will continue to have a very limited following for some time to come. Whatever has real merit is sure to continue. There is no chance for the real worth of the fore-door being questioned. As already outlined, it is beneficial from the point of view of comfort and sanitation, in the touring car; and in the limousine it has given the driver that protection which he has every right to. A car looks much better fitted with a front door which is a part of its design than with a flopping leather shield buttoned on where the doors should be. The external appearance of a car should be looked to in every case, because it is always a factor when it comes to making sales

Introducing Commercial Car

THERE are two ways in which a business concern employing from twenty to 100 horse vehicles can work the transition from horse transportation to motor transportation. One way is the judicious one, the other of the plunging variety. The judicious firm will install one or two vehicles as experimental ones and by its experience with these will be able to judge as to the vehicles best suited for its uses, and the best methods of caring for such vehicles. The plunging type is that in which a concern will immediately do away with its fifty or sixty horse-drawn vehicles and install at once a complete motor outfit.

THE absurdity of the plunging type of installation is apparent, and has been proven. The problem is too big to be handled in this way, and any manufacturer of trucks recommending such a procedure will, in ninety-nine cases out of a hundred, be going contrary to the best interests of the commercial vehicle. This is not because motor vehicles are not to be relied upon, but it is because the step or transition is too great for the concern taking it; there are too many problems involved. To begin with: The proper garaging of an entire fleet of motor vehicles as compared with the stabling of horses is a problem in itself, but the garaging is the small end of the argument. The vehicles must be kept in repair, and the company installing them has no conception of what is necessary by way of a repair force, or repair equipment.

PERHAPS the greatest objection to the plunging type of installing commercial vehicles is that the concern will discover that it has not installed the proper types of machines. It rarely happens that a concern requires a full fleet of the same type of truck. There are cases where a company could handle thirty 3-ton trucks, but there are more cases in which such a company would be more successful by installing two or three 5-ton trucks, a dozen 3-ton trucks, and perhaps a dozen and a half 2-ton trucks. It would be a very expensive error were a concern to install a large fleet of motor vehicles more than half of which might not be the best type for the service.

BECAUSE of the various questions involved in the installation of a motor delivery system the carefullest scrutiny and examination of the buyer and seller is required. It is foolish for a truck maker to sell a company what is not best suited for its needs. The truck maker must gain the confidence of the business man, and he will do that quickest by studying the situation of the business man in giving him only what is best.

BECAUSE of this peculiar question, which enters into the commercial car situation, it is highly important that salesmen for commercial cars study their conditions. It would be better for a maker, building 3-ton trucks, not to sell them to a concern which should use ton trucks, than it would be to sell same. Whenever a company finds out that a truck maker has unloaded machines entirely unsuited for the work, it is almost a sure estimate that that company will not go to that truck manufacturer a second time. The dealers in trucks must build up solid reputations for themselves, and they will do this best and quickest by giving the closest study to the conditions of the buyer, and being conscientious and only selling their trucks where they know they are best suited for the conditions.

Federal Bill Presented At Washington

Pet Registration Measure of A. A. A. Submitted by Congressman Wanger and Is Referred to a Committee of House

WASHINGTON, D. C., Feb. 11—Called the "federal automobile act," instead of the "federal registration bill," there has been introduced into the house of representatives the pet measure of the American Automobile Association which was offered on February 7 by Congressman Wanger, of Pennsylvania. The bill has been referred to the committee on interstate and foreign commerce, and it is hoped by its backers that action will be secured at this session of congress.

The term "automobile" as it is used in the act includes all motor vehicles except motor cycles, and the term "state" includes all territories and districts of the United States, the provision of the act applying to any motor car while engaged in commerce with foreign nations or among the several states and operated and driven from one state to any other state of the United States or from any state in the United States to a foreign country or from a foreign country to any state in the United States.

Distinctions Are Made

It is distinctly noted that this act will not apply to any car operated wholly within the state which is the residence of the owner, and there is nothing in the bill that exempts the car or owner or operator from the regulations of any state in regard to the regulation of motor cars except that when the machine carries a federal license and is engaged in interstate commerce it is exempt from the provisions of the state law in reference to the registration of laws and the licensing of the operators. The owner and operator, however, must comply with the laws of the state in which they reside.

The bill places the federal registration fee at $10, the registration being made with the office of public roads of the department of agriculture. This registration expires on December 31 of the year for which it is made, and can be renewed for the ensuing year upon the payment of a fee of $5.

It also is compulsory that every person desiring a license to drive a car under the provisions of this act shall pay a fee of $5, filling out at the same time a blank which tells all the facts about the operator and which is accompanied by an unmounted photograph of the applicant. No one under 21 years of age can obtain a federal license, and as in the case of the car the driving license expires December 31 of each year.

Each Will Carry Shield

Upon a car being registered with the federal authorities the director of the office of public roads will assign a distinctive number which shall be displayed on the metal placard in the form of a shield, in Arabic numerals 4 inches long and no main stroke less than ⅝ inch wide. Above this number shall be the letters U. S., each letter at least 2 inches in height, and below such number shall be the usual abbreviation of the name of the state in which the owner resides, and beneath the abbreviation the numerals indicating the year for which the shield is issued. It is proposed that the colors of these shields be changed each year, and the shields themselves will be furnished by the federal authorities.

IDEA OF HOW FEDERAL TAG WOULD LOOK

If perchance a holder of one of these shields violates any provision of the federal act he forfeits all his rights and is barred from further registration of a car except upon the filing of a new, verified application for each car owned or controlled by him and the payment anew of the registration fee and in addition the further payment of the sum of $25. The revenues secured under this act will be paid into the treasury of the United States, and the secretary of agriculture is required to make annual reports to congress of the receipts and expenses received or incurred in carrying into effect the provisions of the act.

SLOW ON GOOD ROADS BILLS

Indianapolis, Ind., Feb. 14—While the biennial session of the Indiana legislature is about half over, so far no good roads legislation has been passed. A bill creating a state highway commission has been killed. The house committee on roads has prepared a bill which has been introduced by Representative McGinnis, which, if passed, probably will be the only good roads legislation of the session. This bill provides that all road taxes above $20 shall be paid in cash, instead of worked out, and that road work in townships shall be done under the supervision of two supervisors to be appointed by the township trustee. The motorists like several features of the bill.

The Show Circuit For This Winter

February 13-18—Show at Winnipeg, Canada.
February 13-18—Show of Kansas City Motor Car Trade Association.
February 13-18—Show at St. Louis, Mo.
February 13-18—Show in Convention hall, Washington, D. C.
February 15-18—Show at Grand Rapids, Mich.
February 14-19—Show at Dayton, O.
February 18-25—Pleasure car show at Cleveland, O.
February 18-25—Show at Minneapolis, Minn.
February 18-25—Show at Binghamton, N. Y.
February 18-25—Show at Brooklyn, N. Y.
February 18-25—Show at Newark, N. J.
February 20-21—Show at Portland, Me.
February 20-22—Show at Bloomington, Ill.
February 27-March 4—Commercial car show at Cleveland, O.
February 20-25—Show of Hartford Automobile Dealers' Association, Hartford, Conn.
February 20-25—Show at Omaha, Neb.
February 20-25—Show at Cincinnati, O.
February 20-25—Show at Baltimore, Md.
February 24-27—Show at New Orleans, La.
February 25-March 4—Show at Toronto, Canada.
February 27-March 4—Show of Kansas City Automobile Dealers' Association, Kansas City, Mo.
February 27-March 4—Show week at Indianapolis, Ind.
February 27-March 4—Show at Sioux City, Iowa.
March 4-11—Show at Boston, Mass.
March 4-11—Show at San Francisco, Cal.
March 6-11—Show at Des Moines, Ia.
March 13-18—Show at Cedar Rapids, Ia.
March 14-18—Show at Syracuse, N. Y.
March 14-18—Show in Auditorium, Denver, Colo.
March 18-25—Show in Pittsburg, Pa.
March 15-18—Show at Louisville, Ky.
March 25-April 1—Show of Pittsburg Automobile Dealers' Association, Pittsburg, Pa.
March 27-31—Show of Cleveland Automobile Show Co., Cleveland, O.
April 1-8—Show at Montreal, Quebec.

Making Rules For Motor Truck Tests

S. M. Butler of A. A. A. Contest Board Holds Session in Chicago At Which the Commercial Car Is the Main Issue—National Circuit Idea Also Discussed by Racing Enthusiasts

CHICAGO, Feb. 11—Chairman S. M. Butler of the contest board of the American Automobile Association has been in the city for 2 days formulating rules for commercial truck tests and also revising rules for the 1911 reliability contests. The Manufacturers' Contest Association rules committee, under the chairmanship of Howard Marmon, also has been in executive session trying to work out what is best in the line of commercial car contest rules.

It is generally conceded that many of the commercial car contests held during the past fall were anything but satisfactory, in view of the fact that the results obtained were misleading in many respects. Some manufacturers tried to convince the public that the cost of gasoline and oil was a criterion of the cost of operating motor trucks. This is as misleading as would be a statement to the effect that the cost of electricity on the Pennsylvania 18-hour special would represent the cost of running this train from Chicago to New York. The cost of gasoline and oil is scarcely 10 per cent of the operating expenses of the truck, and Chairmen Butler and Marmon have been trying to get this matter more correctly arranged, so that the rules will be really tangible and of some value.

Rules Will Be Altered

Although nothing has definitely been given out, it is understood that there will be quite a few detail changes in the reliability run rules. The classification of cars and the different kinds of contests will remain unchanged, but it is suggested that the sealing of car parts will be eliminated and many other things done with the object of simplifying reliability contests. Last year many clubs, in outlying sections of the country, found it difficult to conduct the tests. In the majority of cases this was largely due to ignorance of the rules. For this reason the rules have been largely rearranged, so that the parts specially important to contestants are near the front and given greater importance.

"Twenty-two of the commercial car men have signified their intention of joining the M. C. A., with a few yet to hear from," said Chairman Marmon after this meeting. "As near as could be gathered from many individual conversations with these truck manufacturers, the consensus of opinion seems to be that the contest work for this year should be of such a nature that widespread publicity should be given to the fact that the commercial car is in position to unfailingly do the various sorts of short and middle distance hauling that is now done in a general way by horse-driven wagons. The preliminary work of drafting rules for contests probably will be done with an idea of bringing this point out."

The national circuit situation was given sufficient stimulation by A. R. Pardington, who is working on this at the present time at the request of the contest board of the A. A. A. and the Manufacturers' Contest Association. During his stop in Chicago Mr. Pardington spent much time with the different railroad officials of the city discussing terms for the transportation of cars, drivers and officials connected with the circuit. Mr. Pardington states that it will be possible to have a special train or trains, which will transport the cars from place to place, and will carry pullman cars, dining cars and observation cars for the complete equipment of the officials and contestants. In addition to regular freight cars for transporting the cars, there will be other cars that will serve as machine shops, store rooms, tire depots, oil depots, etc. The outfit when complete, as it is expected, will be one of the most interesting that ever has been brought together.

Booming National Circuit

Mr. Pardington starts Monday on a complete circuit of the factories with the object of seeing if he can secure enough companies to enter into the national circuit scheme to make it a success. Beginning with Indianapolis, the different factories will be visited, and it is expected that within 2 weeks there will be a definite announcement as to whether there will be a national circuit or not.

According to present arrangements the plan is to begin the circuit at Indianapolis May 30, and continue it for 5 months. In that time 6,000 miles would be covered by the trains carrying the officials, drivers, and equipment. About nineteen cars would be required, including pullmans and diners. Practically 100 people would make up the party.

EDWARDS TECHNICAL CHIEF

Chicago, Feb. 14—While the announcement has not been officially made by Chairman Butler, of the American Automobile Association, it is given out unofficially that F. E. Edwards, of the Chicago Motor Club, has been selected as chairman of the technical board of the national organization, which now has been made a salaried office. Mr. Edwards has taken up the work of the new office already and last night he left for a trip to the Indianapolis factories to secure the registration of the stock cars of Hoosier manufacture.

Mr. Edwards served on last year's technical board under Alden L. McMurtry, and in addition is chairman of the technical committee of the Chicago Motor Club. He also is a member of the executive board of the American Automobile Association.

RELIABILITY IN OHIO

Columbus, O., Feb. 11—Two cars made perfect scores in the Columbus reliability run, which was finished at 4:30 Thursday. The Speedwell, driven by E. D. Holzmiller, and the Reo, driven by Frank Lawwell, came through without a penalty. The News will give a sterling silver cup to each. All of the ten cars in the contest, however, made an exceptionally good showing.

The cars and drivers competing were: Abbott-Detroit, Frank Snyder; Lexington, J. F. Hawkins; Reo, Frank Lawwell; Speedwell, E. D. Holzmiller; Brush, J. W. Leverton; Brush, S. W. Schott; Maxwell, Raymond Baker; and Rider-Lewis; J. C. Langley. A Columbia, driven by Harvey W. Smith, acted as pacemaker.

Governor Harmon, with a wave of a little silk American flag, was the official starter. The start was made from in front of his East Broad street residence. The route lay over a distance of 250 miles through a number of the important cities and towns of central Ohio. From Columbus the pathfinder started southeast to Lancaster; thence west to Circleville, south to Chillicothe, west to Washington C. H., north to London, west to Springfield, north to Urbana, northeast to Marysville, east to Delaware, and south to Columbus.

Probably the worst roads of the trip were encountered between Columbus and Lancaster. Deep mud offered a stout resistance on this leg of the journey, but all of the machines pulled through. Alternate stretches of good and bad road were met during the remainder of the tour. The run was made in 2 days, with the night stop at Springfield.

COAST ROAD RACE CERTAIN

San Francisco, Cal., Feb. 14—Final arrangements for big Oakland Panama Pacific road race to be run over the Alameda county boulevard course on February 22 have just been completed and from indications this event will rank among the blue ribbon contests of the country. Alameda county supervisors have closed the roads over which the contests will be run and lifted all speed barriers during the morning hours for next week to allow the drivers to practice. Indications are that there will be a huge crowd out to see the races, which will be held in the afternoon.

The course is considered the finest highway in California and the general impression is that a new world's record will be set on the day of the race under fair weather conditions. The entries so far include: The Pope-Hartfords, both of which competed in the Vanderbilt cup race; three Nationals; the Lozier, which

created the new American record at santa Monica; Apperson, Amplex, Simplex, Corbin, Mercer, Buick, Franklin, Velie, Maxwell, and possibly two Fiats.

Teddy Tetzlaff, who will drive the Lozier, declared after his initial spin over the course that he was confident he could break the remarkable record he established in the Lozier at Santa Monica, when his average speed was 72.37 miles an hour. On his statement as to the speed of the course the Lozier factory instructed him to enter.

Jack Fleming and Bert Dingley, the Pope-Hartford stars of the Vanderbilt race, will again pilot the Pope entries, and Ralph de Palma will be at the wheel of either National or Simplex. Harris Hanshue will drive the Apperson, and Wilcox will drive one National.

The race is divided into three events; two for stock cars, light and heavy, and the big free-for-all. The St. Francis hotel trophy will be awarded in the stock car event. The same distance is to be run in the various events as was scheduled when the race was programmed for January 1.

A MINNESOTA PROPOSITION

Minnesota, Minn., Feb. 13—A comprehensive motor vehicle law is to be introduced to the legislature of Minnesota. Among the most important provisions embodied are the raising of the license fee from $1.50 to $2, and the compelling of owners to display license tags on both front and rear of the car. It is specified that non-residents who remain in this state for more than 30 days must obtain licenses. It is defined that a vehicle shall not be driven faster than at the rate of 10 miles an hour for a distance of ⅛ mile in closely built up sections of an incorporated city, village or town, or if this rate exceeds 15 miles an hour in residence districts for a like distance, or if the speed is greater than 25 miles per hour along roads not enumerated within the districts before mentioned for one-quarter of a mile these shall be regarded as prima facie evidence that he is driving at a rate faster than is reasonable and proper. In case a physician driving on an emergency case is stopped for speeding his name, address and number of the car are to be taken, after which he will be allowed to proceed.

Park boards are permitted to make their own regulations concerning the speed and use of motor cars in parks and on boulevards. One of the most important sections is that providing for the creation of a state board of motor car examiners. This body, to be composed of three members, appointed by the governor, to serve 2 years, shall pass upon the eligibility of all applicants for chauffeurs' licenses.

Another provision, which is somewhat novel, is that which would permit a driver, arrested for speeding, to leave his car as bail in the event that he is not able to furnish bail.

King George Approves the Big Match

Rules To Govern Reliability Test Between English and German Teams Are Announced—Inter-Country Affair Will Be Held In Great Britain In July and Will Be For Prince Henry Cup

LONDON, Feb. 4—Having received the approval of King George, the rules that will govern in the team reliability match between the Royal Automobile Club of Great Britain and the Imperial Automobile Club of Germany for the Prince Henry cup have been made public. The big affair is not to be an international competition, it is distinctly stated, but an event which will combine pleasure with a practical test of the touring capabilities of the competing cars. There will be no speed trials or time hill-climbs as in previous Prince Henry tours and the whole affair will commemorate the coronation of King George.

The team match will start from Homberg, Germany, on July 5, the tour going to Bremerhaven, from which point the contestants will sail for Southampton, England, reaching there Sunday, July 9. The tour of England and Scotland will start Monday, July 10, going from Southampton to Leamington, to Harrogate, to Newcastle-on-Tyne, to Edinburgh, to Windermere, to Shrewsbery, to Cheltenham and from Cheltenham to London, where the event will wind up with a banquet at the Royal Automobile Club. Friday, July 14 will be spent at Edinburgh, and Sunday, July 16, at Windermere.

Rules of the Match

There will be fifty cars on each side, and each car entered by a competitor must be his own property. No competitor, driver or mechanic can accept a fee of any kind, whether direct or indirect, from any firm or individual for taking part in the competition. The car entered by a competitor may be manufactured in any country and in order to avoid advertisement neither the name of the car nor the manufacturer's name can be officially published in any way in connection with the tour, nor can any car carry more than the ordinary recognized trade mark as used when the car is sold for private purposes. The German members of the Royal Automobile Club may drive for the R. A. C or for the German club, and vice versa. The club whose team loses the smaller number of marks will be declared winner of the Prince Henry cup. The observers will be officers of the German and British armies and navies, the British officers serving on the Imperial Automobile Club cars and the German officers on the British machines.

Limitations of the Cars

The rules stipulate that the contest is open only to cars of the four or six-cylinder four-cycle type, the limit of the bore of the four-cylinders being not less than 3⅛ inches or more than 5½, and for the six-cylinder not less than 2½ or more than 4½ inches. The maximum stroke is limited to 6.5 inches. Steam cars of equivalent horsepower also are eligible. Each car is required to carry a driver, a mechanic and an observer.

The penalization scheme calls for 1 point demerit for every involuntary stop of 5 minutes or part thereof. Engines may be stopped while tires are being repaired, and also during involuntary stops, the term involuntary stop covering every stop made for the purpose of repair or work relating to the operation of the car, including the lubrication of parts and the replenishing of water, oil or fuel. It excludes, however, work rendered necessary to inner tubes or outer casings. All spare parts may be placed on the car at the commencement of the tour without penalty, and these spare parts may be used without loss of marks for material. Any spare part required after the tour has started will cause a loss of 12 marks on the car for material.

Other Points in the Rules

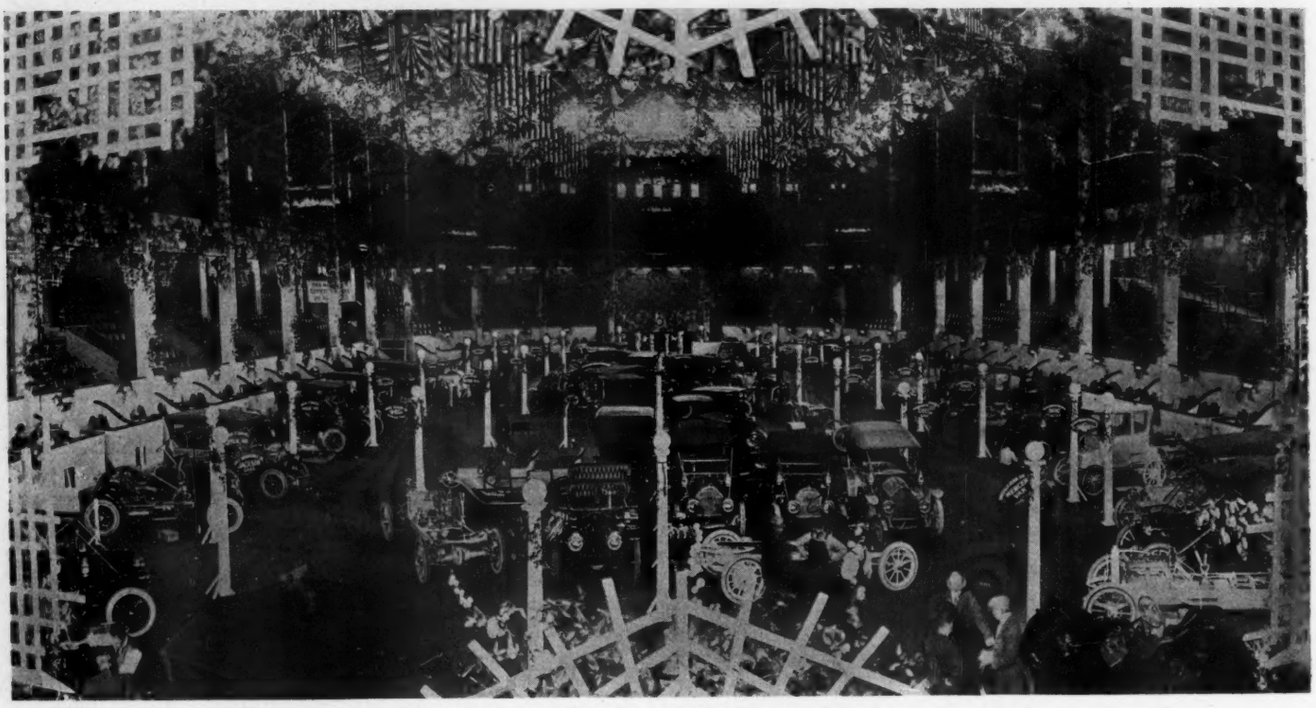
The bonnets of the cars will be sealed and the seals may only be removed by the observers, who after the completion of the necessary work, shall personally reaffix them. The replenishment of the water, fuel and lubricants during the running hours will count as an involuntary stop for the time occupied. It is forbidden to do any work on the car while the machine is in motion, and the driver and his assistant are the only ones that can do this work. Thirty minutes is allowed each morning before the start for replenishment, lubrication and adjustment without penalization, but in case a spare part which is not on the car before the start of the tour is used in this time there will be a penalization of 12 points for material. If the work is not finished in the 30 minutes allowed, the penalization will be 1 point for each 5 minutes or part thereof, in excess of 30 minutes. In the case of a car falling out of the tour there will be a penalization of 50 points per day charged up against the team to which the car belongs.

FORD STARTS RACING CAMPAIGN

Detroit, Mich., Feb. 12—With two new Ford racing cars, Frank Kulick is off for the mardi gras competition at New Orleans. The cars have been prepared at the Highland Park track of the Ford company. They are of the model T type and will be entered in all the free-for-alls. It is hinted at the Ford plant that the firm will also be in shape to qualify its models for stock competition in the 161-230 cubic-inch displacement class, during the coming season.

Minor Show Circuit Is Well Under Way

St. Louis Opens With Its Coliseum Packed to the Doors. Several Cars Not Previously Exhibited Being on View—Washington, D. C., Starts Auspiciously—Rain First Night at Kansas City—Displays Made at Dayton, Memphis and Davenport—Canadians Gather at Winnipeg



GENERAL VIEW OF THE MAIN HALL OF THE COLISEUM AT ST. LOUIS, CARLOADS OF SMILAX AND FERNS LENDING A VERY PLEASING SPRING-LIKE EFFECT

ST. LOUIS, MO., Feb. 13—At the Coliseum tonight St. Louis demonstrated unmistakably the great public interest in an annual motor car show. This fact was disputed by the members of the St. Louis Dealers' and Manufacturers' Association, which after several ballots last fall decided to do away with the yearly exhibit.

It was only after this action of the association, which in previous years has been sponsor for the show, that F. W. Payne, manager of the Coliseum, called a number of the individual dealers together. After one meeting it was seen that there was sufficient sentiment in favor of a display to make its continuation not only possible but necessary. The space went swiftly from the start and after a short time all the available places were taken and there were calls for more than even the Coliseum could accommodate.

When the doors opened at 7:30 o'clock Monday night all of the exhibits were in place. The Coliseum was ablaze with many electric lights, furnished by numerous hanging chandeliers, arcs and soft green lamps that capped the white pillars marking off the dividing line between the exhibits. A fountain played continually at the entrance to the building . A soft green carpet covered the entire floor, the aisles as well as the show spaces. Green boughs and leaves in profusion hung from the high ceiling, which also was decorated with countless flags and blue and white bunting. The exhibits were marked off by green velvet cords, attached to white pillars surmounted by incandescent globes. Made up of carloads of smilax from Georgia, intermingled with flowers, ferns and other signs of spring, the decorations are easily the most pretentious and restful to the eye that have been seen at any St. Louis show.

Before the formal opening a committee made up of one representative from each of the exhibitors entertained a number of out-of-town guests and representatives of the press with a private view of the spectacle, when each of the displays could be examined at leisure and without interference.

Big Crowd the First Night

The attendance the opening night was gratifyingly large, especially in view of the difficulties in organizing the exhibit. For the first time in the history of motor shows in St. Louis, society took the same interest which it had formerly done in the horse show, and no opening night of the equine exhibit was better patronized in a social way. This is taken by motor car enthusiasts to mean the final passing of the horse show in favor of the motor display, especially in view of the fact that the equine show was abandoned when it was discovered that the motorists' plans were to be carried out in spite of the obstacles which were placed in their way.

Poor Commercial Exhibit

An idea of the size of the St. Louis show may be gained from the statement that 115 pleasure cars are on display. The commercial car exhibit does not make such an excellent showing, but this doubtless is due to the fact that all of the space was taken early and there was no more to be had, premiums having been offered before the opening. The total value of the exhibits is placed at $750,000, the lowest priced car being valued at $500 and the highest at $7,500.

It is believed that 4,000 persons from out of town will arrive to inspect the exhibits, according to estimates made by heads of agencies the opening night of the show, when a formidable advance guard already had appeared. In order to make it easy for visitors to go to and from the Coliseum cars will be placed

at their disposal and each day at noon there will be a special array of demonstrating cars, which will make the rounds of the leading hotels in order to afford guests an easy means of reaching the display. There also will be a daily parade made of cars of the same manufacture as those shown at the Coliseum, headed by a band and bedecked by banners.

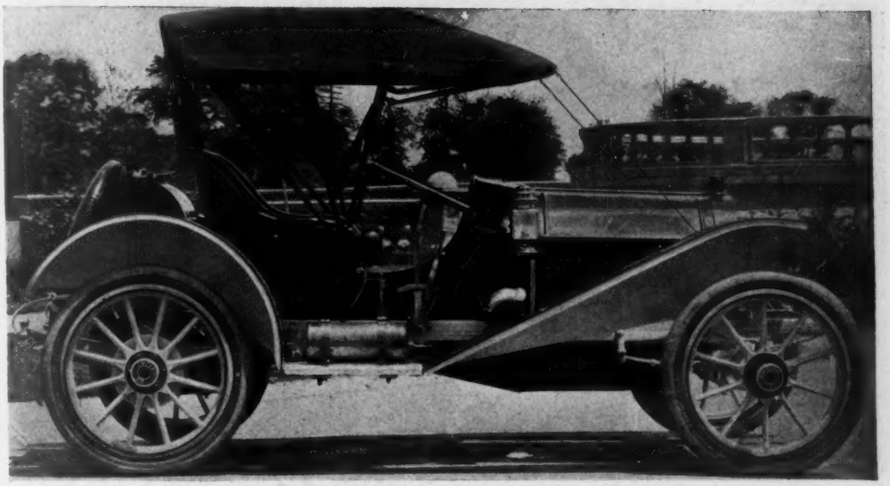
The cars that are being shown include the Reo, Falcar, Michigan, Gramm truck, Case, Ohio electric, Ohio gasoline pleasure and commercial cars, Auburn, Empire, Atterbury truck, Stearns, Waverley electric, Overland, Pope-Hartford, Columbus electric, Krit, Firestone-Columbus, Selden, White, Jackson, Kissel, Regal, Mercer, Van, Wilcox truck, Erving truck, Owen, Marion, Victor, Speedwell, Klinekar, Velie, Haynes, Cole, Paige-Detroit, Halladay, Little Giant truck, Franklin.

In addition to these local exhibitors, displays are made by the White company, the Louis J. Bergdoll Motor Co., of Philadelphia; Ideal Commercial Car Co., of Detroit, and the Conant & Donelson Co., of Conway, Mass.

That St. Louis is becoming something of a motor car manufacturing center is evidenced by the number of St. Louis products which were seen for the first time at this exhibition. There are two different pleasure cars in this list, while another which has temporarily gone out of business is again preparing to commence manufacture. In the commercial field there are three St. Louis cars which had not been seen elsewhere. The feature of the show this year was not, as many expected, cheap cars, but better cars at nearly the same prices as have been asked during the past few years.

Empire in Two Body Types

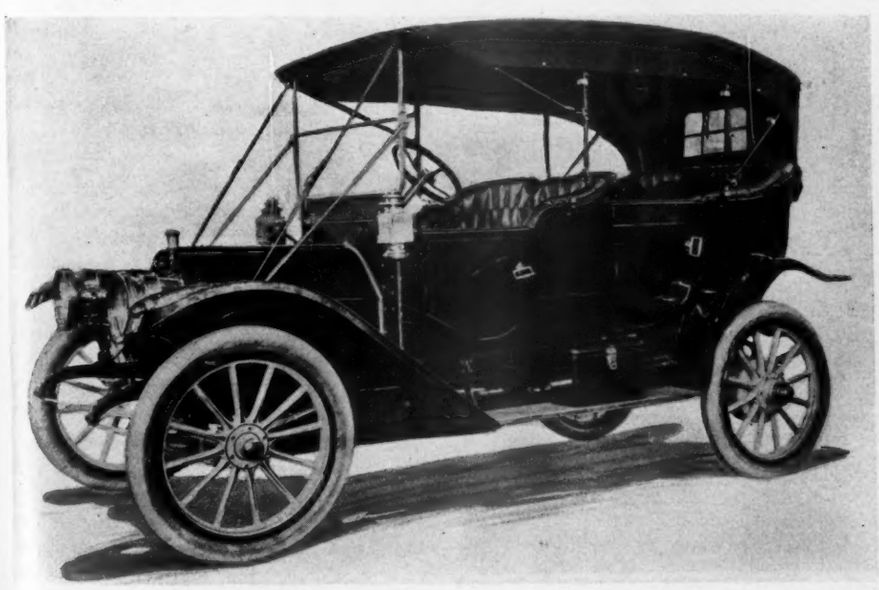
In the Empire line two different bodies are shown on the same chassis, one the standard roadster body and the other a coupe body. A feature of these bodies is that they are interchangeable and at a



THE EMPIRE ROADSTER HAS A RACY APPEARANCE

standard price both the roadster and the coupe bodies are furnished, so that the roadster may be converted into a coupe or vice versa in a very short time. The general specifications of the Empire chassis show some special features which are worthy of note. The use of the T-head motor in a car of this class is the exception. This allows valves of large size and permits placing the spark plugs in a perfectly clean and cool combustion chamber. The four cylinders of 3½-inch bore and 4-inch stroke are cast en bloc. The lubricating system is remarkably simple, as there are four deep compartments cast in the crankcase, which hold 3 quarts of oil, and are replenished by means of a hand pump and an auxiliary reservoir. Knife blades on the caps of the connecting rods dip into the oil in the crankcase and afford a general splash lubrication. Either single or dual ignition is furnished, the former with an Eisemann high-tension magneto and the latter with a low-tension Remy magneto and battery. The Schebler carbureter is provided with a warm air supply for cold weather. A thermo-syphon cooling system is used with a vertical-tube radiator and a belt-driven fan.

The method of mounting the motor is particularly worthy of note. This consists of three-point suspension, one point being at the front cross member of the frame while a steel hanger at the rear of the motor forms the other two points. The flywheel and cone clutch are inclosed by an aluminum housing bolted to a flange on the crankcase. At the rear of the housing a steel yolk is swiveled to a yolk on the housing of the propeller shaft. The object of this construction is to maintain perfect alignment. The rear axle is connected to the clutch by means of a shaft and a large universal joint, with the gearset as a unit with the rear axle. The gearset is the Stutz design and is a three-speed selective type. The semi-floating rear axle is mounted on roller bearings and two independent sets of brakes are used, both internal expanding. The wheels are fitted with 32 by 3½-inch quick detachable rims. Semi-elliptic front springs are used, with three-quarter elliptic rear springs.



THE VICTOR AS A FIVE-PASSENGER TOURING CAR

Victor a Demountable Car

The Victor, made by the Victor Motor Car Co., is unique in that it is the manufacturer's idea of what a demountable car should be. In this car an attempt has been made to obtain maximum accessibility and ease of repair and replacement. To what extent this ideal has been realized will be evident by the statement that if anything goes wrong with the differential or propelling gears all that is necessary is to take out a few bolts in the rear-axle housing and the gears can be slipped out, while the car stands intact; or the propeller shafts on the rear axle can be slid out through the hubs.

These cars appear as both shaft-drive and chain-drive cars, but the motors in both are the same. They are cast in pairs, are of the L-type, and also have the accessible or demountable feature, so that bearings, valves, etc., can be replaced or adjusted with exceptional ease. The

THE ERVING RELIABLE TRUCK IN DELIVERY SERVICE

motor has a self-contained oiling system and the water circulation is effected by means of a centrifugal water pump operated by the same shaft which drives the magneto. A flat-tube copper radiator with a belt-driven fan completes the cooling system. The transmission in the shaft-drive car is of the selective three-speed type and the chain-driven cars have friction drive. The rear axle of the shaft-driven car is of a floating type. The runabout has a 20-horsepower motor, two cylinders 5 by 4 inches in size, with a Schebler carbureter, friction transmission, double-chain drive, with a wheelbase of 103 inches and 30 by 3-inch tires. A four-passenger surrey is offered, having a four-cylinder 4 by 4-inch motor, 110-inch wheelbase and 31 by 3½-inch tires. The five-passenger touring car has a four-cylinder 4 5-16 by 4½-inch motor, 112-inch wheelbase and 34 by 3-inch tires. On this chassis is also fitted a five-passenger vestibuled foredoor body and a runabout or a surrey.

In the addition to the pleasure cars the Victor Motor Car Co. produces a light car for delivery purposes. The chassis is practically the same as used on the pleasure car. A heavier car is the 1 to 2-ton truck, which is furnished with 40-horsepower chassis.

Owen with Big Wheels

The Owen cars attract attention first of all on account of the size of the wheels. The 42-inch wheels give the car a distinction it would not otherwise have. Another feature is the left-hand drive with right-hand control. In this car the steering wheel is located at the left and the gear-shifting lever—a straight rod with a ball at the upper end, giving an easy hand hold—is located in the middle of the floor boards at the right of the driver. The motor is distinctive on account of its comparatively long stroke, as it has a 4¾-inch bore by 6-inch stroke. The length of stroke gives exceptional turning power at slow engine speeds. The motor has four cylinders cast in pairs; it is the L-type with the valves on the right-hand side. The cooling water is circulated by a centrifugal pump, the ignition is by Bosch magneto, with a storage battery as an auxiliary for starting purposes. A leather-faced cone clutch with a selective gearset and shaft-drive embody the transmission features. A heavy nickel-steel frame having a double drop gives the car a very low center of gravity, although a road clearance of 11½ inches is provided. The wheelbase is 120 inches. To this chassis is fitted several body styles, the most noticeable one being the Berlin limousine. A foredoor seven-passenger touring car, a foredoor close-coupled car and a two-passenger roadster with rumble seat are among the bodies supplied.

Rayfield of Unusual Design

The Rayfield car is an unusual one in that it follows very closely European practice in putting the radiator at the rear of the hood, making it look very much like a Renault. Two different chassis are made, one having a four-cylinder motor and the other a six-cylinder motor. The wheelbase of the four-cylinder car is 100 inches, with 32 by 3½-inch tires, while the six-cylinder car has a wheelbase of 117 inches and 34 by 4-inch tires. In other respects the two models are the same. The cylinders are 3-inch bore by 3½-inch stroke, are of the T-type and are cast in pairs. A mechanical force feed lubricating system supplies oil through the center of the crankshaft. The motor is water-cooled, on the thermo-syphon principle, with a vertical flat-tube radiator and a belt-driven fan. Ignition is by Bosch magneto, with automatic spark regulation. Fuel is fed by gravity to a Rayfield carbureter. An internal expanding clutch is used, with a selective four speed gearset located on the rear axle. A feature of the gearset is direct drive on the third speed, while a higher speed can be obtained on the fourth without speeding up the motor. A shaft drive with torsion tube propulsion and a floating rear axle complete the transmission system. These cars appear as either a four-cylinder roadster, a six-cylinder roadster or a six-cylinder touring car.

HARRY FIRE-PROOF PORTABLE GARAGE

Erving Reliable Truck

The Erving Reliable commercial car appears regularly as a 1½-ton truck. Any body may be fitted at the option of the purchaser. A four-cylinder motor is used, having a 4½-inch bore by 5½-inch stroke, with the cylinders cast in pairs. The subframe of the motor and the transmission rest on two brackets at the rear end of the frame and on a rocker at the front end to prevent the motor arms from breaking off by twisting of the main frame. The motor and the gearset are removable from the frame by taking out six bolts, when the motor and subframe can be pulled forward. The radiator is hinged and swings out of the way of the motor, and the dash is sectional and part of it comes out when the motor is pulled forward. Ignition is by the Bosch dual system, the coil being located between the two central cylinders and a lever extending through the dash retards or advances the spark, while a storage battery is used for starting. A cylindrical oil tank is installed between the radiator and the motor. The radiator is protected from road jars by a flat spring suspension, while the motor has a three-point suspension. The clutch is of the single disk type, while the gearset is of the three-speed progressive type. A double-chain drive is used with the differential on the jackshaft. The springs are semi-elliptic in front and platform in the rear.

The Wilcox Trucks

The Wilcox trucks appear in three sizes —a 3-ton, 1½-ton and a 1-ton truck. The 3-ton and 1½-ton trucks are equipped with a 4¼ by 4½ four-cylinder motor, with the cylinders cast in pairs. They

Kansas City Show in Convention Hall Is An Italian Garden

are water-cooled and a Bennett carbureter is used. A Bosch dual ignition system with a storage battery furnishes the spark. A cone clutch with a three-speed selective gearset and a double-chain drive complete the transmission system. The wheels are 36 by 4 inches in front and 36 by 3½ dual in the rear on the three-ton and 4-inch single on the 1½-ton, solid tires being, of course, used, with a wheelbase of 126 inches on the larger and 117 inches on the 1½-ton truck. The body is suspended by means of elliptic springs in the front, with platform springs in the rear. The suspension of the rear spring is a noteworthy feature in that a double shackle is used to prevent side motion and prevent the side swing from affecting the rear tires. The ends of the jackshaft are supported by braces, which are bolted to the frame. The 1-ton truck has a four-cylinder motor, with 4¼ by 4½-inch cylinders cast in pairs. The wheelbase is the same as in the 1½-ton car, but the tires are 36x3 inches in front and 36x3½ in the rear. Any body is fitted to these cars at the option of the purchaser, a specialty being buses and sight-seeing cars.

Harry Steel Portable Garage

The steel garage made by the O. K. Harry Steel Co. is the result of an endeavor to provide a portable garage which at the same time would be absolutely fireproof. It is made of No. 24 gauge galvanized steel reinforced with heavy corrugations and steel angles.

So far as the portability is concerned a 14-foot by 20-foot building can be taken apart and made into a package small enough to go through the ordinary freight car door, allowing it to be shipped fourth class.

KANSAS CITY, MO., Feb. 14—The second annual show of the Motor Car Trade Association opened last night in Convention hall with the interior of the big building bedecked like an Italian garden. The seats in the upper balconies are hidden by a canopy, while part of the first balcony has been built out to permit of several car exhibits being housed there. There are forty exhibits on the main floor and the remaining twenty are in the balcony under a pergola that circles the hall. At one end of the balcony is a tea garden. In all there are thirty-eight pleasure gasoline cars, ten electrics and twenty commercial vehicles on view.

The opening of the show last night was marked by rain, but this seemingly had little effect on the attendance, for the building was well filled when Mayor Brown declared the show open. The cars on exhibition are: Gasoline pleasure cars—Cole, Hupmobile, Apperson, Buick, Welch, Cadillac, Chalmers, Peerless, Firestone-Columbus, Stoddard-Dayton, Ford, Reo, Maxwell, Columbia, Mitchell, Oldsmobile, Packard, Pierce-Arrow, Stevens-Duryea, Studebaker, E-M-F, Flanders, Velie, Garford, Marmon, Rambler, Alco, Moon, Winton, Brush, Oakland, Case, Carter, Chadwick, Knox, Abbott-Detroit, Gleason, McFarlan.

Commercial trucks—American, Buick, Peerless, Wilcox, Reo, Packard, Studebaker, Stafford, Alco, Detroit, Winton, Brush, Rapid, Reliance, Alden Sampson, Avery, Saurer, Grabowsky, Knox, Gleason.

Pleasure electrics—Hupp-Yeats, Fritchle, Waverley, Rauch-Lang, Columbus, Columbia, Studebaker, Baker, Woods, Detroit.

As a curtain-raiser to the show there was a parade of owners on the streets of Kansas City yesterday morning, more than 200 cars turning out. Another event on the program is the convention of the Southwest Motor Car Dealers' Association, which opens tomorrow, which will bring together many agents.

IOWANS ENJOY THEIR SHOW

Davenport, Ia., Feb. 12—In every particular, attendance, number of sales, quality of exhibits and general attractiveness, the second annual show of the Davenport Automobile Club, which ended tonight, proved a complete success. The Coliseum, the most available place in the tri-cities, was the home of this season's show, and the increase in floor space over last year as well as the decorative scheme resulted in the exhibits being shown off to the best advantage. Every square inch of floor space was sold a week before the show opened, February 9, and many exhibits were of necessity refused. Fourteen tri-city dealers composed the exhibitors, showing thirty-seven cars, five chassis and one truck, the last named from the Sternberg Mfg. Co., of Milwaukee.

The attendance, estimated at 5,000, was twice that of last year. On Friday, the big day of the show, there were 2,000 admissions, according to F. W. Skinner, chairman of the boosting committee of the show. Many of these were from outside of the tri-cities, show week attracting a considerable number of visitors to Davenport, Moline and Rock Island.

Many of those attending the show were farmers, who, more than any one class, seemed to be buying. Although there were but some two dozen sales reported, nearly all of the dealers stated that they had secured a large number of prospective customers with whom they expected to close. The touring car priced around $1,500 seemed to be the most popular machine, although roadsters were also in de-

HOW THE DAVENPORT SHOW LOOKED TO THE IOWANS

mand. Although but one truck was on exhibition, there was considerable interest in this line, and many of the dealers predicted that the next show would find a large exhibit of this class of vehicles.

Many of the exhibits shown at the show here were from the Chicago show, including the Chalmers, Cadillac, Midland, Cole 30 and Hupmobile, all chassis. Owing to the fact that the last week of the latter show was devoted to trucks, the local effort did not suffer by its competition.

Among the most popular exhibits at the show were the chassis of the Chalmers and Cadillac companies, both of which were being continually demonstrated. These were withdrawn before the closing of the show, in order to reach Kansas City in time for exhibit there. The Buicks, owing to inadequate freight service, did not arrive until the third day of the show.

It had been planned to place exhibits of accessories, but although this phase was paid some attention, it did not come up to expectations.

The following were the cars shown: Ford, Inter-State, Velie, I. H. C., Hupmobile, White, Maxwell, Cole, Halladay, Rauch & Lang electric, Midland, Ohio electric, Cadillac, Chalmers, Pierce-Arrow, Buick, and Oldsmobile.

SHOW FOR SOUTHERNERS

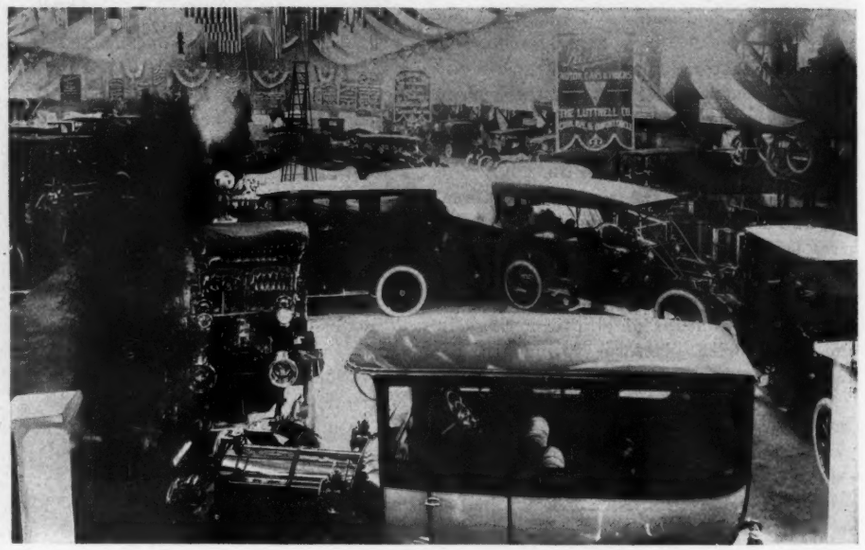
Memphis, Tenn., Feb. 14—The first attempt of the Memphis Automobile Club to promote a motor car show gives every promise of being a decided success. The affair opened at 2 o'clock this afternoon and among those in attendance the first day were dealers and motorists from Tennessee, Arkansas and Mississippi. Memphis has made every preparation to attract the crowds and with the combination of the show and a good roads convention it looks as if this will be the largest gathering of motorists the south has had for a long time. The good roads session will begin Thursday night and great preparations have been made to secure a large attendance.

The show itself is being held in the Auditorium, on which more than $10,000 has been spent in the way of decorations. There are more than 150 cars of different makes on view, among the concerns represented being: Stoddard-Dayton, Overland, Staver-Chicago, Metz, Kelly truck, Detroit electric, E-M-F, Studebaker electric, Flanders, Stevens-Duryea, Hudson, Lozier, White, Buick, Packard and Chalmers.

OMAHA READY FOR SHOW

Omaha, Neb., Feb. 13—The sixth annual Omaha show opens Monday evening. Every inch of available space will be occupied with exhibits of sixty of the most prominent makes of pleasure cars, and a dozen commercial vehicles. In addition there will be a big display of accessories. Outside requests for space have had to be turned down. New companies recently applying for space are the Maytag, Case, Alco and others.

Washington Opens to Large Crowds



GENERAL VIEW OF THE WASHINGTON SHOW

WASHINGTON, D. C., Feb. 13—Under weather conditions almost ideal, the second annual show of major importance in the capital opened tonight to a record-breaking crowd. The show is being held in Convention hall and from the time the doors were swung wide until almost midnight motor enthusiasts poured through the gates and gave the 165 cars on exhibition a thorough inspection.

The cars shown are ranged along in two blocks extending the length of the building with a fringe of booths strung around the walls. The decorative scheme is simple, consisting of bunting in which the national colors are the predominating note. Greenery is used with considerable effect and cut flowers add to the charm of the general aspect.

There are few novelties displayed at the show, all of the models on exhibition having been seen at one or more of the exhibitions that have taken place earlier in the current season. Here and there, however, there is a specially prepared show car among the standard types to attract attention. Among these a gold-plated Washington, shown by the Carter Motor Car Corporation, a local factory.

The accessory display is not large, although it compares favorably with other shows of this class, and includes practically all lines.

Fifty-three makes of cars are shown, including five types of electrics. There is an entire absence of freight vehicle atmosphere, no trucks being exhibited, the only thing in the show that approached the delivery wagon type being a Flanders model equipped to carry packages.

The affair is given under the auspices of the Automobile Dealers' Association of Washington, the organization which conducted the very successful show last year.

The chief feature of the opening session, aside from the size of the crowd, was the discriminating knowledge shown by the patrons. Body styles and unusual color effects might attract, but it was the perfection of engines and the structural excellencies that held attention. It was an auspicious opening, with lines of private motor cars ranged up and down all the streets adjacent to Convention hall, while their owners were busy inside inspecting and perchance selecting their successors.

Dealers from many towns in Maryland and Virginia are attending the show. Many Washington dealers control territory in the two adjoining states and have arranged to have their subagents take in the show. President Taft has been invited to attend and is expected to drop in to the show some afternoon during the week. A feature of the show is the unusually large number of trophies displayed by the Pullman, Maxwell, Columbia, Buick, Chalmers and Moline.

Catalog collectors were not in evidence and none of the exhibitors would admit at the conclusion of the initial session that he had not secured anywhere from five to twenty-five good prospects or had actually closed one or more sales.

The makes of cars on view include the following: Ford, Velie, Owen, Overland, Oldsmobile, E-M-F, Flanders, Studebaker, Maxwell, Columbia, Pierce-Arrow, Cadillac, Baker electric, Packard, Chalmers, Peerless, Stevens-Duryea, Hupmobile, Pope-Hartford, Matheson, Everitt, Oakland, Columbus electric, Washington, G. J. G., Moon, Apperson, Regal, Detroit electric, Buick, Welch, Cutting, Reo, Woods electric, Amplex, Cole, Krit, Lion, Schacht, Stoddard-Dayton, Rambler, McIntyre, Moline, Paige-Detroit, White, Rauch & Lang electric, Pullman, Bergdoll, Warren-Detroit, Marion, Thomas, Inter-State, Franklin, Locomobile.

Canadians Gather at Winnipeg Show

WASHINGTON SHOW FROM ANOTHER ANGLE

WINNIPEG, CANADA, Feb. 13—For the first time in the history of the industry in the Canadian northwest the trade has assumed a position where a show was possible, and where 3 months ago one show was promoted today three large auditoriums were thrown open to the people of the west, with displays of seventy-two different makes of cars, representing the output of many of the big American factories.

The chief exposition conducted under the auspices of the Motor Trades' Association was opened this afternoon by Lieutenant-Governor McMillan, with Mayor Evans also on the program. The big auditorium with its 11,000 feet of floor space is handsomely decorated in a universal color scheme of green and white. The season for the show was specially selected owing to the presence in the city of thousands of outsiders, who are here from the south, east and west for the great curling carnival. Public interest in the shows is intense and indications already point to an even greater year for the industry during 1911 than last year.

Nothing marks the tremendous growth of the motor industry in western Canada better than the big displays of cars which are to be seen at the three shows in the city during this week. One year ago the trade was represented in the city by thirteen firms handling cars and accessories. Now the number is more than forty and agencies for many other lines are rapidly being closed up by new companies which desire to enter the lucrative field. The forty firms today represent more than seventy varieties of cars of Canadian and American factories. As yet the number of Canadian factories is small, but at the shows it is found that close upon 50 per cent of the cars exhibited are now being assembled in Canada.

The total floor space now being occupied for motor shows is more than 20,000 square feet and still there are firms which have been unable to secure room for displays. If the three shows were confined under one roof Winnipeg would enjoy the distinction of the biggest motor show ever held in Canada and one of the finest annual shows outside of New York and Chicago.

Recognition of the importance of the western field as a future point of distribution for great quantities of cars is being shown by a large number of American and Canadian manufacturers who have flooded the field with special sales representatives to expound the construction of cars during show week. A novel feature of the big show is a three-wheeled Knox, which was the first vehicle ever imported into western Canada. It is being used to demonstrate the serviceability of the motor car. The car is still in every day use, although it has been running steadily for 10 years.

When tradesmen announced the regular show and started out to find exhibitors enough to take up the 11,000 feet of space secured, they anticipated difficulty in using the floor space. Under the energetic publicity work of Manager Emmett it was little more than a week before every inch was gone and before the date for the show arrived today applications had been made to show a total of 281 cars. Of this number, with three shows in progress, there are just about one-third of that number being exhibited. Enthusiasm in the good results to be obtained from the shows is shown by the fact that one firm wired to the Moon and Lozier factories in the states to ship exhibit cars via express to insure arrival in time for the opening.

The class of cars shown is appropriate. A couple of years ago western dealers grasped the idea that the cheap car was the goods for the market. The theory was knocked cold in a season. Today cars on the floor run in price from $650 to $10,000, and every exhibit is representative of a tested proposition.

Among the cars displayed at the big show are the following Canadian assembled cars: Russell, McLaughlin-Buick, Reo, Overland, Everitt and Ford. American manufacturers are represented by the Hupmobile, Peerless, Kisselkar, Thomas Flyer, Cadillac, Franklin, Mitchell, Packard, Regal, Case, E-M-F, Winton, Glide, Empire, Brush, Paterson and Halladay.

At the independent shows the following cars are exhibited: Krit, Jackson, Republic, Lozier, Moon, Warren-Detroit, Maxwell, Columbia, Metz, Schacht, Paige-Detroit, Speedwell, Chalmers, Mitchell and the VanDyke truck.

EXCELLENT SHOW AT DAYTON

Dayton, O., Feb. 14—Although the weather was rather inclement last evening there was a splendid opening attendance at the annual show held by the Dayton Automobile Dealers' Association at Memorial hall. From the moment that Mayor Burkhart pressed an electric button while seated in his office and many thousand lights blazed forth a constant stream of visitors entered the portals of Dayton's noted show place. The decorating and the placing of the cars indicated expertness, and when the lights were turned on the scene certainly reflected credit on the Dayton Automobile Dealers' Association. The exhibits consist of twenty-eight booths, exhibiting more than thirty different makes of cars, totaling 100 models and a fairly complete line of accessories of all kinds. A feature of the exhibition is the showing made by the half-dozen big racing cars. Altogether the event surpassed anything ever attempted by Daytonians.

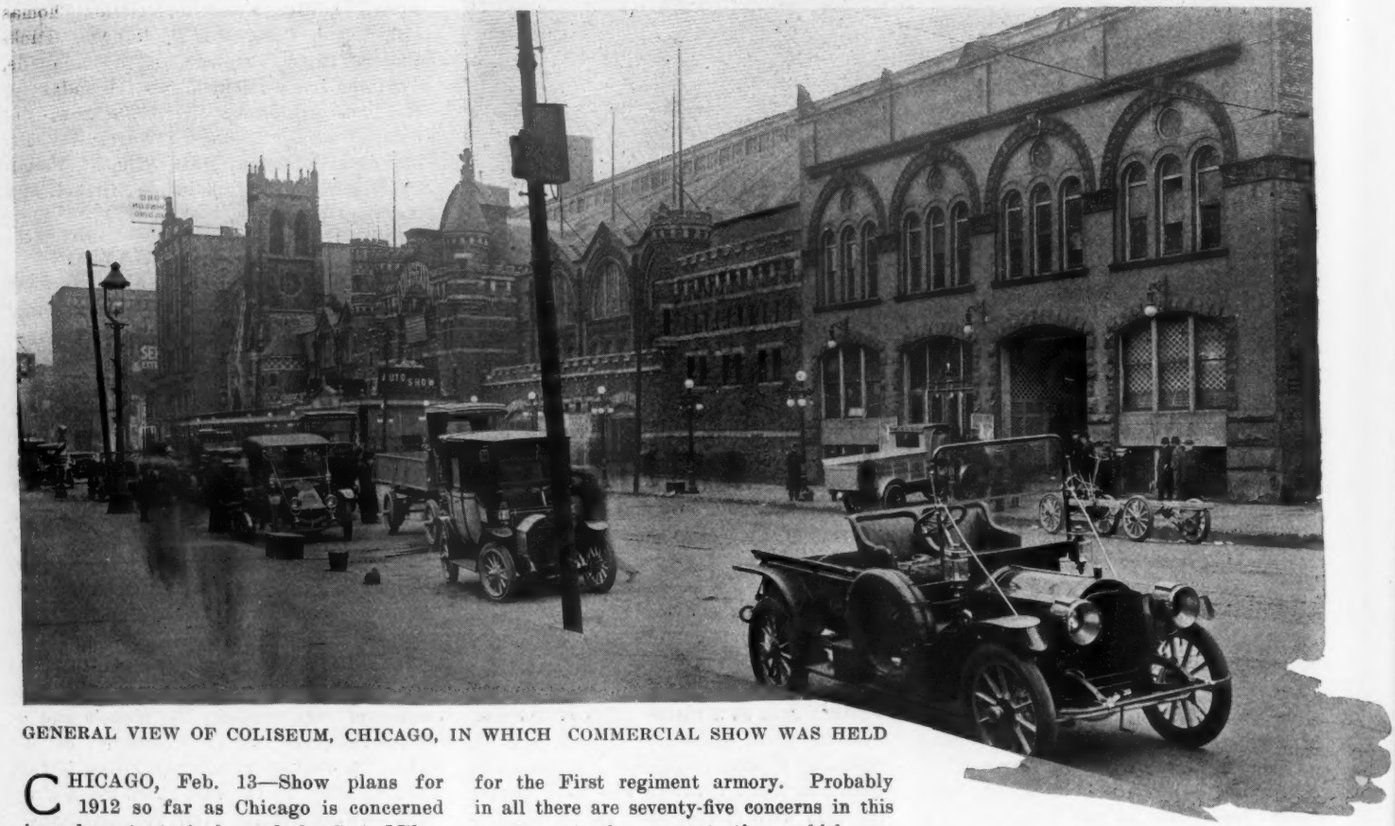
The cars shown are: Hudson, Marmon, Cadillac, Pierce-Arrow, Columbus electric, Hupp-Yeats electric, E-M-F, Studebaker electric, Garford, Flanders, Chalmers, Packard, Oldsmobile, Oakland, Dayton electric, Stoddard-Dayton, Hupmobile, Reo, Overland, Locomobile, Buick, Peerless, White, Baker electric, Dayton truck, Ford, Rambler, Speedwell, Regal and Great Western.

ANOTHER KANSAS CITY SHOW

Kansas City, Mo., Feb. 14—"The Kansas City Automobile Dealers will open the doors of Convention hall Monday, February 27 to a show that will include more than seventy-five makes of pleasure cars and trucks and more than fifty exhibits of accessories and motor cycles," says A. M. Blake, secretary of the promoting organization. "Twenty-five makes of commercial vehicles, some of them new to this territory, will be exhibited. Special trains have been arranged for us from Oklahoma and Kansas points. More than 3,000 dealers will attend the meeting during this week to organize a Southwestern Automobile Dealers' Association."

More Room Needed for Next Truck Show

Looking into Future, N. A. A. M. Secures Armory in Addition to the Coliseum for the 1912 Commercial Car Exhibition in Chicago—Last Week's Display of Power Vehicles Declared To Have Been Success of the Winter—Over 20,000 Paid Admissions—Many Agents Attend

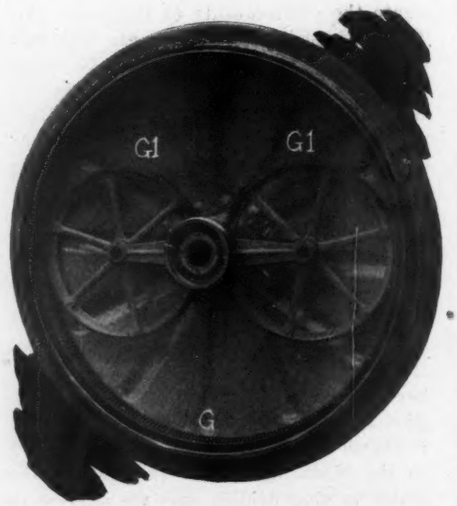


GENERAL VIEW OF COLISEUM, CHICAGO, IN WHICH COMMERCIAL SHOW WAS HELD

CHICAGO, Feb. 13—Show plans for 1912 so far as Chicago is concerned have been tentatively made by S. A. Miles, general manager of the National Association of Automobile Manufacturers, who today announced that the same program will be carried out a year hence as the one that just came to an end Saturday night, when the doors finally closed on the commercial car show. The 1912 show will be held at just about the same period as the one of 1911—the first 2 weeks of February—but the scope of the affair will be broadened in that next time the First Regiment armory will be in the show group for the full 2 weeks, which means that the commercial car show has jumped out of its swaddling clothes in its first year and now demands another building.

Will Use Armory Next Year

The business vehicle show which closed Saturday night was confined entirely to the Coliseum and its annex, which accommodated fifty-eight makers of trucks, 150 makers of sundries, and nineteen motor cycle concerns. While these apparently had enough space this time, the industry is advancing with such rapid strides that Manager Miles is convinced that in another year the Coliseum will not be big enough for the business car show, and because of this he has started negotiations for the First regiment armory. Probably in all there are seventy-five concerns in this country at the present time which are actively engaged in the production of trucks and light delivery wagons. Of these, fifty-eight were in the Coliseum and most of the others were not there because of the mix-up over the Grand Central palace. Had they been in it is more than likely that the Coliseum would not have been large enough to accommodate all of them. The experience of the recent show is that the makers, being new to this sort of business, did not realize their needs and in applying for space cut it down to the minimum, not taking into consideration the needs of the spectators who might come to see the exhibit. In consequence of this the stands were crowded most of the time and the spectators did not have enough elbow room. This will be corrected in another year, and with the armory to catch the overflow there should be a commercial car show which will be second to none in the world.



REDUCTION GEARS G1 IN THE REAR OR DRIVING WHEEL OF THE WALKER ELECTRIC TRUCKS. THE DRIVE IS FROM THE AXLE SHAFT THROUGH THE GEARS G1 TO THE INTERNAL GEARS G ON THE WHEEL

Shows Attracted Many

As yet no exact figures as to the attendance of the two shows have been arrived at by Manager Miles, who is at present engaged in counting the tickets and gathering statistics as to the general results. While he cannot be explicit in his statements, Manager Miles is of the opinion that the commercial car show probably attracted between 50,000 and 60,000 peo

ple in the 6 days and nights it was open. Of these, 20,000 actually paid admission fees, while the remainder was distributed among manufacturers, dealers and business men. The statistics show that the management gave 20,000 tickets to the exhibitors for general distribution, while 10,000 more were sent broadcast throughout the country to business men, who were invited to attend the show and who were extended the usual courtesies. In adition to this, the show itself required at least 2,000 attendants, while more than 1,000 agents were present during the second week of the show at one time or another.

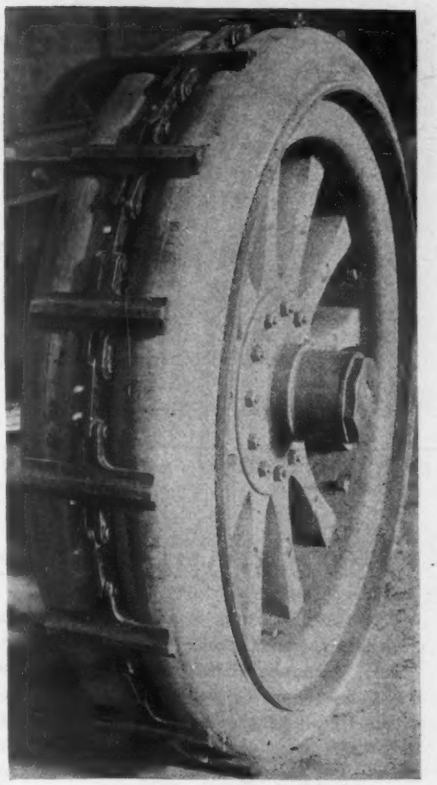
From the Four Winds

To a certainty the commercial car show was a success far in advance of the anticipation of the promoters. Not only did it attract at least 1,000 agents from all parts of the country, as is illustrated by the fact that cars were sold to men from Los Angeles on the west and Boston on the east, but it also brought here hundreds of municipal officials who were interested in the fire-fighting apparatus, police patrols and ambulances. Many aldermen came from the smaller cities and towns and evinced a great interest in the power wagon, and the opinion was freely expressed that the time was not far distant when every city and town will be forced to adopt the motor wagon and oust the horse.

So far as the pleasure car week is concerned, Manager Miles believes that it just about held its own in the way of business done and agents in attendance, but he hardly thinks that the attendance as represented in the box office was so great as it was a year ago, caused undoubtedly, he declares, by the elimination of the 25-cent tickets, which formerly were distributed broadcast by makers and dealers. This year makers and dealers who gave away tickets to their customers had to pay the full price—50 cents,—and in consequence of this the attendance suffered. Manager Miles thinks, however, that this has been a good thing in that it has eliminated that class of people who went because they could get tickets for nothing, people who had no intention of buying and simply got in the way of those who went to the show for the purpoce of picking out their cars. So well satisfied is he with the success of this innovation that he intends to follow the same system next year at show time.

Everyone Seems Satisfied

The last half of the commercial car week attracted an attendance that kept them improving day by day, and along with it the business kept getting better and better, so that when the doors closed Saturday night a more satisfied lot of exhibitors never left the Coliseum. Considerable business was done during the week, but it was not the actual sales that so impressed the exhibitors as the vast amount of business in the near future that looms up. One concern alone estimates that it will sell $50,000 worth of trucks within the next month as a result of the show, which brought to its stand merchants they otherwise could not have reached.



ANTI-SKID CHAIN USED BY SAURER COMPANY ON DUAL TIRES

Buyers Are Wise Ones

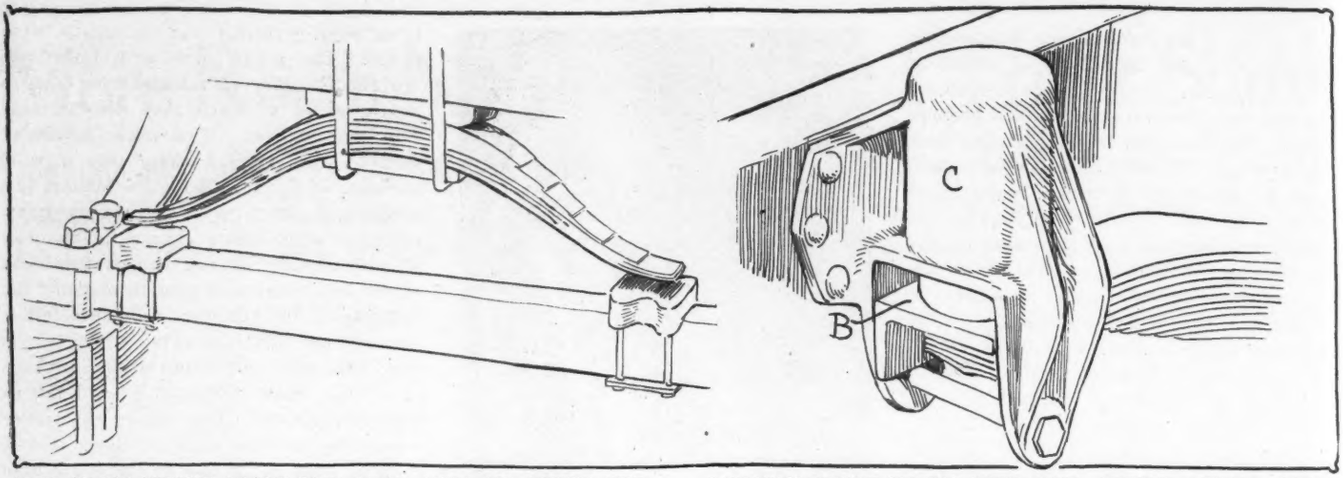
It was a noticeable point that the merchants and others who inquired about motor trucks evidently know something about the industry, for in the main their questions were pertinent and covered a wide range. The main point with them was that of the cost of maintenance, and in nearly every instance they went deeply into this subject. The week developed that on this subject there was a wide variance of opinion among the makers and exhibitors. Each was anxious to know what the other fellow claimed in the way of maintenance figures, and at least one of the exhibitors sent men throughout the building to find out what the other fellow was saying. This private inquiry, it is said, developed that claims of maintenance of a 3-ton truck started at $2 and ran as high as $14 a day. One maker who makes a specialty of 3-ton trucks declares that it costs at least $12 a day to run a machine of that size and that the merchants should not be misled by some of the statements that were made as to the small cost of maintenance.

Names Easily Secured

Another point noted in connection with the show was the frankness of the prospects. They always were willing to give their names and addresses, in marked contrast to the pleasure car purchasers, who usually do everything in their power to prevent the dealer from getting an inkling as to their identity. The merchant wants to be shown, and being interested in the motor proposition the more opinions he can get on the matter the better equipped he is to make his final choice of a commercial truck.

During the week the proposed Chicago-New York motor truck run received considerable attention at the hands of the truck makers, who were invited to air their opinion of the contest at a dinner which was given them by the Chicago Motor Club Thursday noon. Representa-

TRUCK BUILT SPECIALLY FOR USE IN JAPAN, HAVING SPECIAL STEERING KNUCKLES TO GET AROUND THE SHORT TURNS IN THE ROADS



ALCO CROSS SPRING ABOVE THE REAR AXLE TO ASSIST THE SEMI-ELLIPTICS IN CARRYING THE OVERLOAD

SAMPSON TRUCK SPRING WITH COIL SPRING INSIDE CYLINDER C, RESTING ON PLATE B TO CARRY EMPTY TRUCK

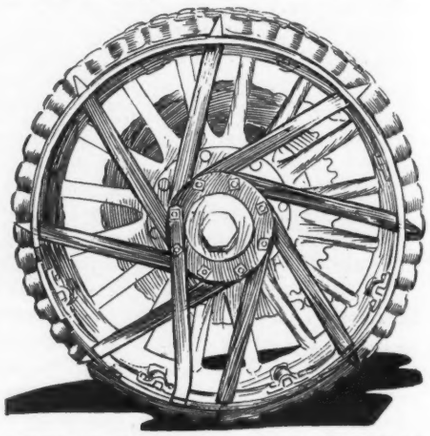
tives of at least fifteen or twenty concerns attended, among them being W. E. Metzger, the newly elected president of the National Association of Automobile Manufacturers, who represented the Hewitt truck. Opinion as to the feasibility of the run were about evenly divided. While several were decidedly opposed to the idea, there were others who volunteered to make entries as soon as the rules were out, believing that such a contest would be of national importance and give the trucks publicity they could not get in any other manner.

Marmon Gets M. C. A. Recruits

On Friday Howard Marmon, chairman of the rules committee of the Manufacturers' Contest Association, held a meeting at the New Southern at which were present many of the truck makers, who were invited to give their ideas as to rules for truck contests, and also to become members of the Manufacturers' Contest Association. Many of them joined the M. C. A., and it is estimated that as a result of the session there will be twenty truck concerns represented in the M. C. A. in the near future.

Developing the Various Lines

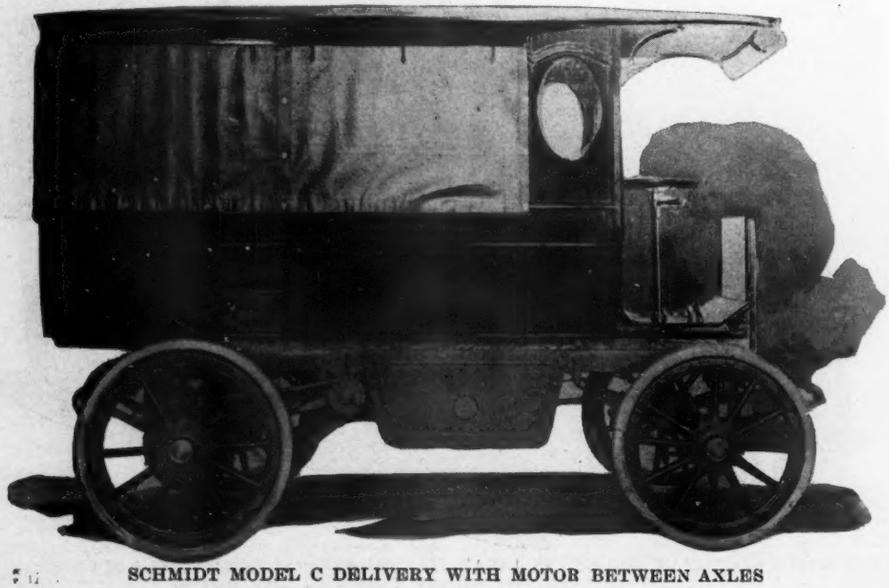
VERSATILITY is what the truck man needs. In the car line the most successful company has been that concern which has departed least from the conventional lines. There has been more money in bringing out one style of pleasure car from the beginning to the end of the season instead of multiplying the number of models. In the truck business the situation is the reverse. There are a thousand avenues of possibilities, and it is only by developing all of them that the full measure of utility will be obtained. Those manufacturers who have made a specialty of police patrol and fire department work have been well rewarded for their efforts. During the commercial show week in Chicago there were representatives from many of the cities in attendance at the show. The fire departments of a score of western cities were represented by delegates and the same was true of the police departments. Speed is an essential in fire and police departments and this seems to have been a leading reason for the general enthusiasm taken in the commercial vehicle at the show. The farming vehicle offers numerous advantages and few makers have endeavored to meet the requirements of this field. There



AVERY TRUCK WHEEL WITH ICE RIM ATTACHED, SHOWING IN POSITION HOOKS TO GRIP THE ICE

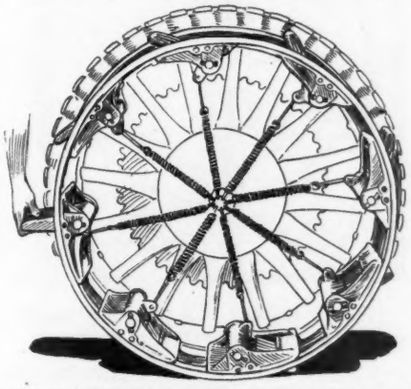
is a demand for a farm tractor, that is, a light type of vehicle with very broad driving wheels and a short wheelbase. The broad driving wheels are necessary to prevent sinking into the soil and the short wheelbase is necessary for close maneuvering. At present it seems almost impossible to design a vehicle which is suitable for truck service in the city and also suitable for plowing, or grinding grain on a farm. The conditions are widely varying, and because of this it is believed that the course followed in Europe will be pursued in America, namely, that of bringing out tractors designed specially for farm work.

A further avenue of development is a farm truck suitable for carrying the produce to market in sections where stone roads do not exist. Such sections are numerous, and after a rain it would be impossible to use a truck of any nature on the gumbo or dirt road. It would be possible to bring out light tractors with very broad wheels suited for such work.



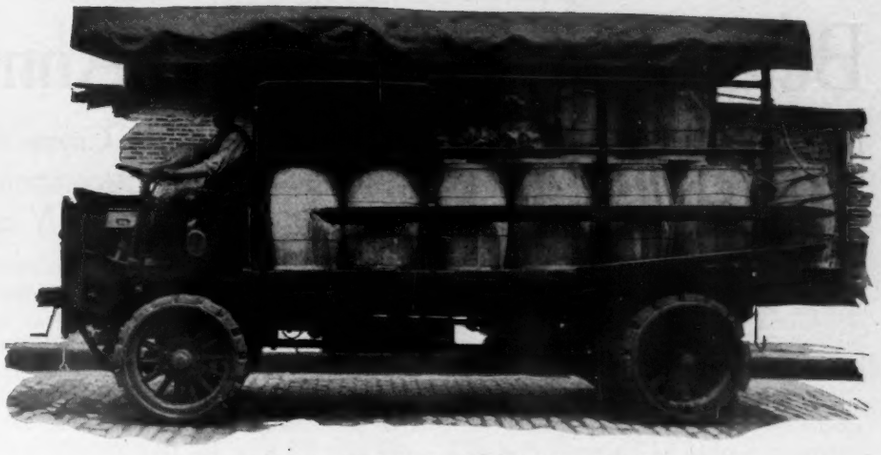
SCHMIDT MODEL C DELIVERY WITH MOTOR BETWEEN AXLES

It would seem from many inquiries that not a few of the makers are not giving sufficient attention to the development of a commercial vehicle well suited for the farmer. One farmer who visited the Coliseum wanted a gasoline vehicle to take the place of the big steam traction engine he uses for plowing his fields. What he wanted would be a heavy tractor with sprags that would hinge to the frame and have a free end to drop to the ground and form a brace for the tractor. The tractor would draw a bank of six or a dozen plows and would pull them by a windlass on the truck. The truck would operate about as follows: Leaving one end of the field it would travel 100 yards into the field and then anchor in position by dropping the sprags. The motor would then be used to drive the windlass and pull the bank of plows from the end up to the tractor. Immediately the plows reach the tractor, the motor is declutched from the windlass and connected to the tractor wheels, and the tractor run another 100 yards on leaving the plows behind. Again anchored by its sprags, the tractor pulls the plows up to it by the windlass. With



AVERY TRUCK WHEEL WITH MUD RIM ATTACHED, SHOWING BROAD RIM AND HINGED HOOKS THAT GRIP THE MUD

a scheme of this nature the farmer would save not a little money because he could use the tractor for other farm duties when not plowing, whereas with the present traction engine it remains idle the remainder of the year when not used for plowing.



HEWITT 7-TON TRUCK FOR BARREL TRADE

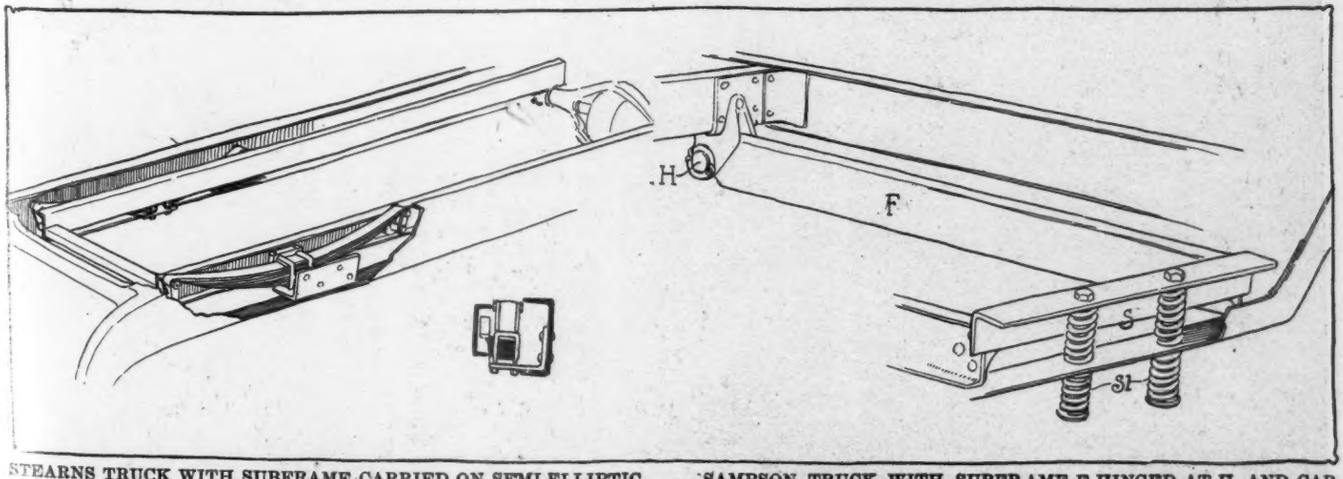
Truck for Japan and Saurer Chains

A MOTOR van especially constructed for the Japanese government by the Süddeutsche Automobilfabrik was recently submitted to official trials superintended by a government representative, Major Nosiri. This vehicle is intended for a useful load of about 2 tons, which limit, in view of the narrow roads and weak bridges so frequent in Japan, could not be exceeded. Moreover, it had to be given a considerably smaller weight than the standard 2-ton type of the constructors and an exceptionally large turning angle of the front wheels, allowing even narrow curves to be readily negotiated without any inconvenient backward traveling. The car is equipped with a 30-35-horsepower motor, with 4⅛-inch bore and 6-inch stroke, of the standard load van motor type of the Gaggenau firm.

During recent trials continued for some days on the roads of the Black forest the vehicle, in spite of its relatively light construction, was found to transport heavy loads with great ease. After going through the trials without any hitch, the car was shipped to Japan.

The trials were held in weather that was anything but favorable and the roads were none too good, yet the big German truck did everything it was called upon to do, much to the delight of the Japanese representatives, who were particularly impressed with the ease with which the machine negotiated the short turns. As this was the point impressed upon the designers, the Japanese unhesitatingly accepted the German truck upon behalf of their government. Orders for more are expected soon.

Believing that chains on rubber tires should be employed as little as possible, or in other words only when it is unsafe to travel with a smooth tread, the Saurer company, of Paris, has produced a quick-detachable model of non-skid for use on its trucks fitted with twin solid rubber tires. The non-skid portion consists of a ribbed transverse steel bar, the under face of which is quite smooth and flat, which forms the alternate links of a special chain. The chain itself occupies the space between the two rubber bandages, in which position it is not in rubbing contact with the road and the tire. The non-skid is quickly dismounted by the withdrawal of a couple of bolts in the chain. It is claimed, and the claim appears to be justified, that this type of non-skid had practically no injurious effect on the rubber bandage



STEARNS TRUCK WITH SUBFRAME CARRIED ON SEMI-ELLIPTIC SPRING IN FRONT

SAMPSON TRUCK WITH SUBFRAME F HINGED AT H, AND CARRIED IN FRONT BETWEEN SPRINGS S AND S1

Belgians Hold Their Annual Car Show

Ford Is Only American Concern in the Palais du Cinquantenaire and Display Attracts Great Attention—Same Decorations Used In 1910 Are Found In the Big Building This Year

BRUSSELS, Jan. 28—At this year's annual Belgian show there only was one representative of America's industry. Four Ford cars were displayed by the Paris Ford agency. The stand, which was located against the wall, was by no means attractively decorated, nor was it in a prominent position as compared with most all of the other car stands. But the Ford representatives were ready for business, and they were successful.

"Show me," said the Motor Age correspondent, after the man in charge had told him about the sales. "Yes, show me that you got those contracts—that you made those sales."

Without further comment the original contract sheets were shown. One man, it was thus seen, purchased twenty cars and took the agency for the Ford in a certain territory; another bought ten cars and thus secured the exclusive sale for the car in his state. All in all close to fifty cars were sold, the regulation binding deposit for each car having been made.

The writer purposely gives these full details so as to show that even in a country where the prejudice against the American car is so great that most all who have thus far handled machines made in the United States either have gone broke or given up the proposition, there is an opportunity to be successful. However, it all depends on how you do it.

As in former years the show was held in the Palais du Cinquantenaire. The decorative scheme was almost identical as last year's; in fact the stands, the posts, and other material used were from the previous show, but nobody seemed to care. The only change of importance from 1910 was that the wide and long galleries were used, and this made the whole exposition more imposing.

Aim at Accessibility

The tendency to simplify, to do away with parts which render accessibility difficult, is greater than ever, yet nothing is taken away to the detriment of the perfect operation of the car. Most of the manufacturers have the same models they had last year, the only difference being that the motor's stroke is greater with most of them. Chassis are shown by nearly all the makers, some of them showing even more chassis than completely equipped cars. Among the latter, the torpedo style seems to be in greatest favor, and there are several instances where the body builders have brought out some splendidly designed carrosseries. Where there are many fore-door bodies, these apply most all to touring car bodies, the regulation two doors still being quite a la mode for the big closed cars.

About the latter part of the show many manufacturers hung up the customary "sold" sign or signs on either cars or

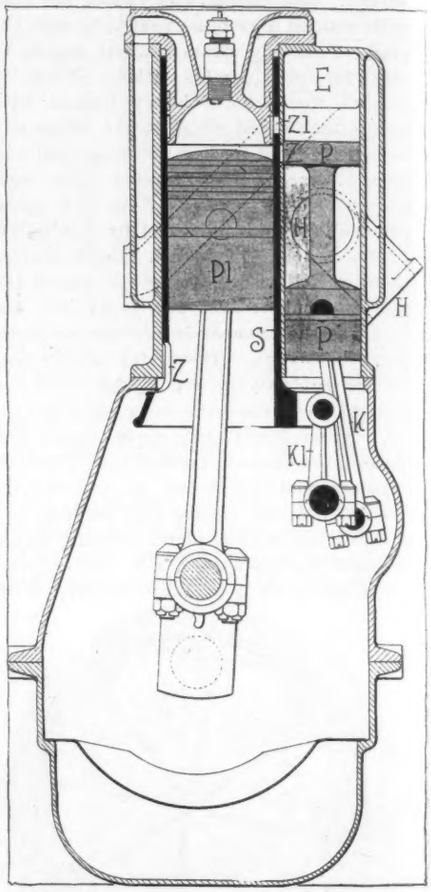
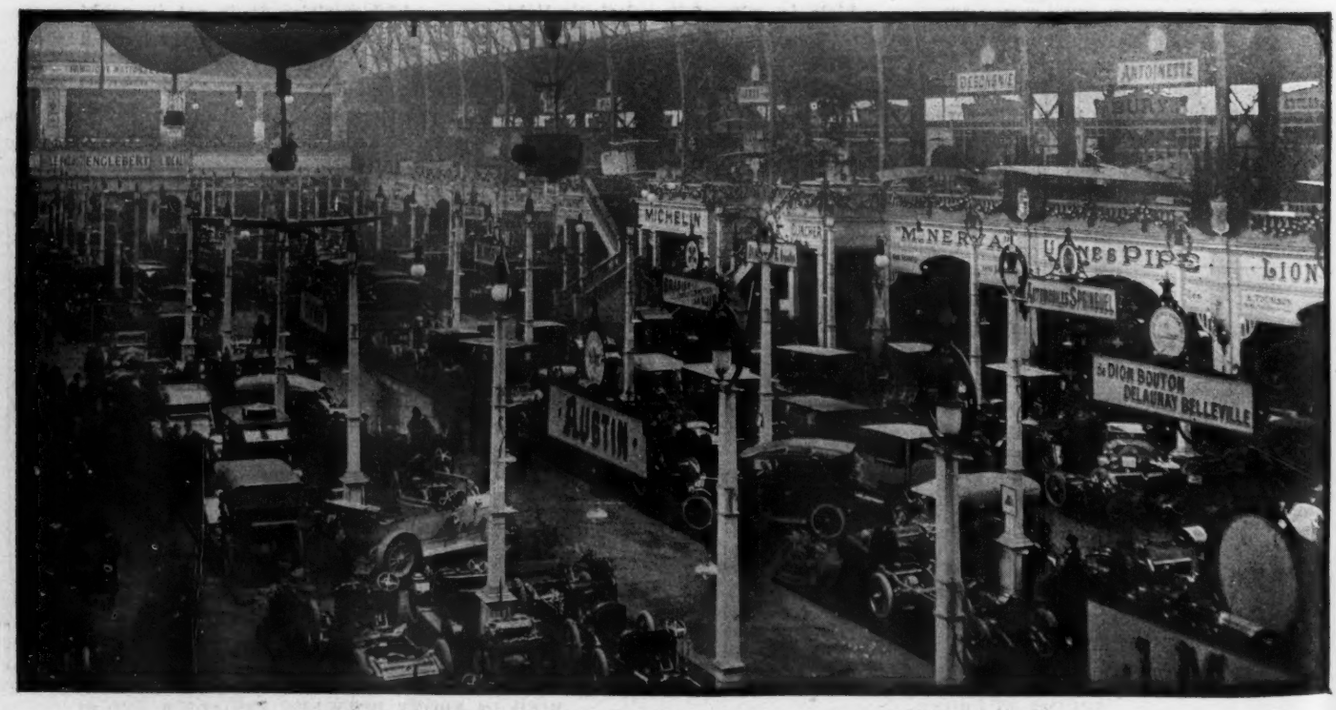


FIG. 1—SECTION OF MIESSE MOTOR STARTING EXPLOSION STROKE

THE SLIDING SLEEVE S SURROUNDS THE MAIN PISTON—P IS PISTON VALVE



GENERAL VIEW OF BELGIAN SHOW IN PALAIS DU CINQUANTENAIRE

Only One Real Novelty Is On Display

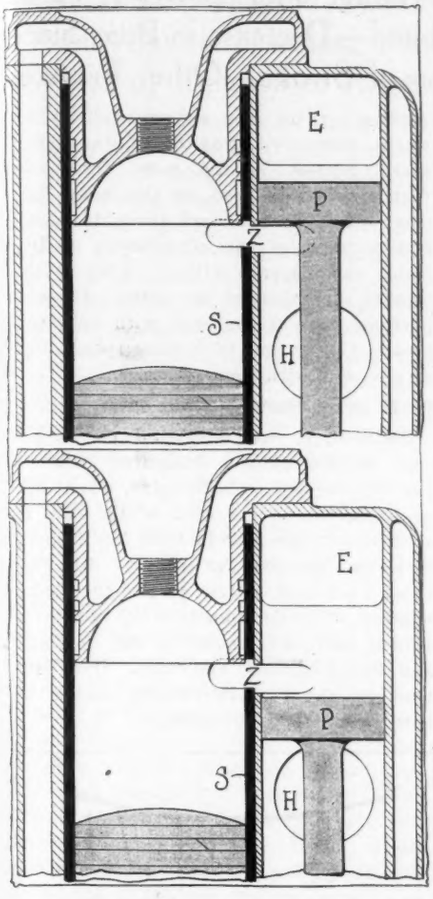


FIG. 2—MIESSE MOTOR ON SUCTION STROKE

FIG. 3—MIESSE MOTOR ON EXHAUST STROKE

Miesse Combination Sleeve and Piston Valve Motor Has Reciprocating Piston Operating Within Single Sleeve Instead of in Two As Found in Knight Design of Motor Car Engine

chassis. In one instance, where a rather high-priced French car was being shown for the first time at a Belgian show, a sign bearing the words, "Sold twenty-three times," was appended on the chassis. The Motor Age man asked one of the attendants about it and was told that actually that many cars, or rather chassis, had been sold during the show. The following day the writer asked someone else at the booth and was told that the twenty-three sales represented the total sales of that particular chassis since the London show, thus including the sales in London, then in Paris and those made here, if any.

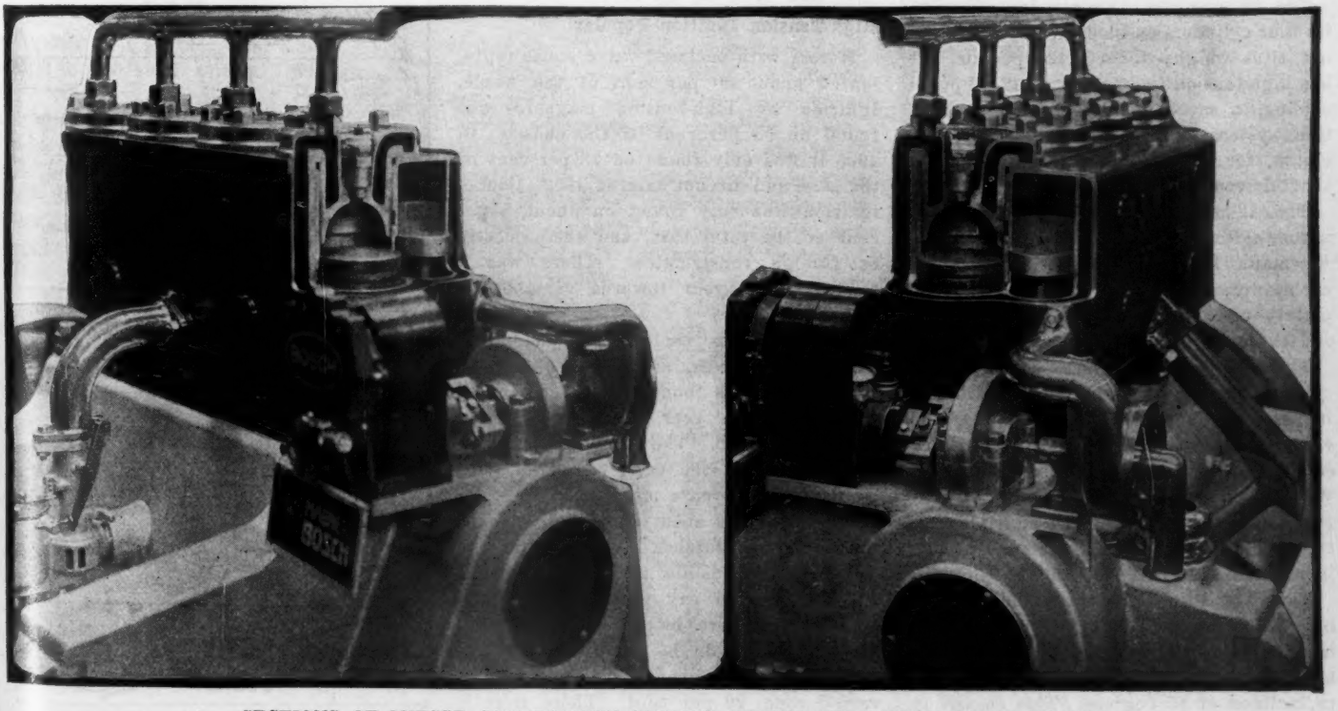
Speaking about those foreign cars and chassis, it might be of interest to mention that the day before the close of the show the customs officers told the Ford agents that their cars probably would be the only ones which would remain in Belgium, all the other foreign exhibits going back to where they came from.

Naturally some concerns of known reputation, although they did not advertise what they had sold, did dispose of many cars. Again, others, like the Minerva-Knight, did not sell many cars for the simple reason that their outputs have been contracted for long ago, and most of the agents have sold all the cars they could get this year. Few, if any other Belgian cars, are now selling so well as the Minerva, of which 1,200 are to make up the 1911 output, as compared with 650 in 1910 and 400 in 1909. The big Antwerp plant now employs about 1,300 men, all engaged exclusively in the making of the Minerva cars.

This year, more than in 1910, the small cars, or at least those of moderate horsepower, seem to find much favor. A 10 or 12-horsepower car like those shown by l'Auto-Metallurgique, F. N. Miesse, Peugeot, Austin, etc., is bound, so it seems, to find a large demand.

The Miesse Motor

The greatest novelty of the Brussels show is the Miesse combination sleeve and piston-valve motor. The reciprocating piston operates within a single sleeve instead of two sleeves as in the Knight design, and in a small cylinder to the side is a reciprocating piston which controls the exhaust and mixture. Fig. .. shows the general scheme of this novel motor with the main piston P1 operating within the reciprocating sleeve S. In the side of this sleeve is a port Z1 which must register with the port Z in the cylinder wall before mixture can enter. In the smaller cylinder at the side is the double piston P reciprocated through a connecting rod K from an eccentric shaft. From this shaft the sleeve S is driven through the connecting rod K1, the intake manifold is designated E, the exhaust manifold H. This illustration shows the motor at the beginning of the explosion



SECTIONS OF MIESSE COMBINATION SLIDING SLEEVE AND PISTON VALVE MOTOR

stroke, at which time the small upper part of the piston P covers the port V in the cylinder wall, and the sleeve S is at its highest position so that its opening Z1 is between the cylinder head and the cylinder wall.

Fig. 2 shows the relative positions on the aspiration or suction stroke. The piston P is beneath the port Z, so that the mixture entering by the passage E has three exits to the combustion chamber. The sleeve S is lowered so that its port Z1 coincides with the port X in the cylinder wall. In this position the piston P is between the port Z and the opening H into the exhaust manifold.

Fig. 3 shows the position of the different parts on the exhaust stroke, in which the ports Z and Z1 coincide, but the piston P is at the top of the port, thereby giving free passage for the exhaust gases through the port and to the exhaust manifold E.

From the illustrations it will be seen that the Miesse motor has a detachable head for each cylinder, which head is waterjacketed. The interior of the head is concave as in the Knight patent and the spark plug is mounted vertically in the dome.

It is not known as yet what the patent situation on this combination motor is, and whether the reciprocation of the sleeve S will in any wise infringe on the present Knight patent.

Some of the Cars

The 10-14 horsepower F. N. chassis has a four-cylinder motor, cast in pairs, having 2.95 inches bore and 3.5 inches stroke; thermo-syphon cooling, shaft drive, metal disk clutch, Bosch high-tension ignition, three speeds and a reverse, and three brakes. Wheels are of the same dimensions.

The 10-horsepower Peugeot chassis, with its four cylinders en bloc, 2.75 by 5.1, without tires weighs about 1,425 pounds. It has high-tension ignition, centrifugal pump cooling, a mechanically-operated lubrication system, a progressive leather cone clutch, four speeds and a reverse, and is shaft-driven.

The 12-horsepower F. I. F. chassis is a four-cylinder en bloc motor, 2.75 by 4.3, Eisemann high-tension ignition, a Solex carburetor, thermo-syphon cooling, a cone clutch, mechanically-operated lubrication, and three brakes.

The 14-16-horsepower Miesse has a four-cylinder motor, cast en bloc, with 3.1 inches bore and 4.3 inches stroke, the valves being located on both sides, but covered up with a plate easily detachable. Water circulation is through a centrifugal pump. The clutch is of the multiple-disk type; the carbureter is a Zenith. The lubrication is force feed.

The little Pipe is a four-cylinder monobloc motor, 2.75 by 4.3, and rated at 12 horsepower. Like all the Pipe motors it has interchangeable valves, which are set or inclined at 45 degrees. This chassis is chain driven.

French Note Trend In Motor Design

Recent Show Develops That Average Horsepower is 12 as Figured From 117 Chassis Exhibited—Decrease in Bore Since Last Year Due to Increased Ratio of Stroke—Other Features

PARIS, Feb. 6—According to semi-official statistics published on the recent Paris salon, the average horsepower of the 117 chassis exhibited by eighty-four manufacturers was 12, and the average bore of the cylinders was about 80 millimeters, or 3.1 inches. In 1906 the average bore was 95 millimeters, the decrease being largely due to the increased ratio of stroke to bore.

The statistics only deal with bare chassis, complete cars being ignored, for the most improved models were generally shown in chassis form only. The highest ratio of stroke to bore was on the Sizaire-Naudin car, with 70 by 170 millimeters; Hispano-Suiza had 80 by 180 millimeters, and Gregoire 80 by 160 millimeters. Out of the total number of chassis exhibited only 3 per cent had a single cylinder; 1 per cent had two cylinders; 77 per cent had four cylinders; 18 per cent had six cylinders, and 1 per cent had eight cylinders. The 77 per cent of four-cylinder models was divided as follows: 6 per cent with separate castings, 32 per cent with the cylinders in pairs, and 39 per cent with all four cylinders in a single block. Of the 18 per cent of six-cylinder motors, 9 per cent had the cylinders in three sets of two, 6 per cent had two sets of three, and 3 per cent had an en bloc casting. The monobloc four and six-cylinder models represented 42 per cent of the total, compared with only 8 per cent in 1906 and none at all in the year 1904.

High-Tension Ignition Popular

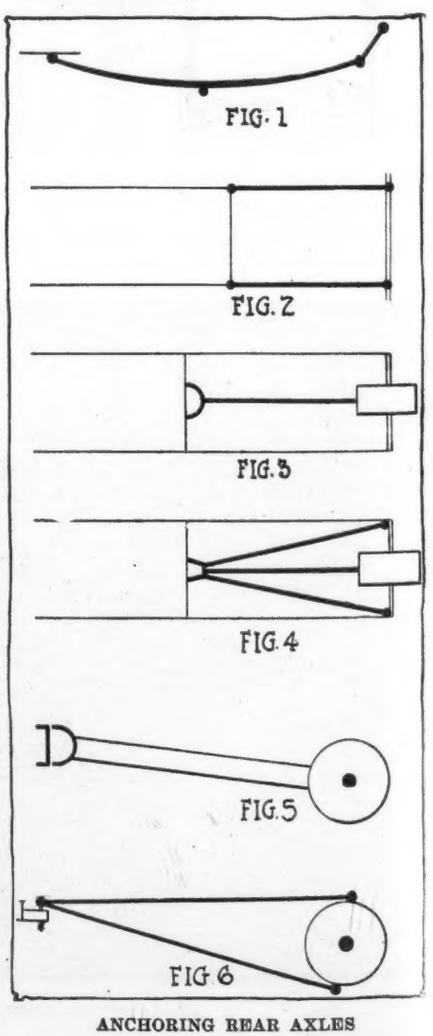
Motors with enclosed valve stems represented about 30 per cent of the whole. Ignition by high-tension magneto was found on 98 per cent of the chassis; in 1906 it was only found on 72 per cent of the cars, and did not exist in 1902. Double ignition was only found on about 5 per cent of the total cars, and these mostly of foreign construction. There was a tendency this year towards variable ignition advance.

Thermo-syphon cooling has made remarkable progress, as is shown by the fact that it was found on 56 per cent of the chassis this year, compared with 14 per cent in 1906. The pump was used on 44 per cent of the cars, compared with 86 per cent 4 years ago.

The show was about equally divided in the matter of clutches. The metallic section was responsible for 46 per cent—multiple disk or dry plate clutches, and 52 per cent were leather cone clutches. These latter could be subdivided as follows: Ordinary cone, 32 per cent; inverted cone, 20 per cent. There were a few isolated examples of friction drive. Although there is a strong tendency towards four-speed gear boxes, the three-speed gearset is the most frequently found, for it is used on the many light cars, which do not need the extra gear, and on most of the six-cylinder models, which can dispense with it owing to the greater suppleness of the motor. The proportions were 5 per cent with only two speeds, 53 per cent with three speeds, and 45 per cent with four speeds.

Shaft Drive Shows a Gain

Shaft drive was employed on 94 per cent of the chassis, compared with 63 per cent in 1906. Chain drive, which was employed on 62 per cent of the cars in 1902, and 37 per cent in 1906, has dropped down to 3 per cent for the year 1910. Of these 3 per cent, nearly all had the chains encased. The de Dion type of transverse cardan shaft was found on the Bazelaire and Pilain chassis, and worm drive was used on the English Daimler and a 20 horsepower Darracq model.



ANCHORING REAR AXLES

Recent Paris Salon Produces Statistics

High-Tension Ignition Found on 98 Per Cent of the Cars—Thermo-Syphon Cooling Has Made Remarkable Progress—Division of Opinion as Regards Clutches—Shaft Drive Gains

A variety of methods were adopted for anchoring the rear axles. On 57 per cent of the chassis there neither was torque tube nor radius rods, the effort being absorbed by the springs only, Fig. 1. Other methods employed were radius rods below the frame members, as on the Brasier and Rochet-Schneider, Fig. 2; and a central tube terminating in two arms attached to the transverse frame member carrying the gear box, as on the Fiat and Panhard-Levassor models, Fig. 3. A few, as Mercedes and Horch, employed a triangular arrangement of rods, Fig. 4. Torque rods were of two main classes: a tube carrying the propeller shaft, with a variety of methods of attachment, Fig. 5, and a triangular structure, either of pressed steel or two separate tubes, Fig. 6. La Buire and Cottereau were the only firms having a double type of rear axle allowing the rear wheels to be canted.

Rear Axle Construction

Owing to the great variations in detail, it was impossible to draw up accurate statistics regarding rear axle construction. Not much change had been made in the matter of brakes. Isotta-Fraschini and Rolland-Pilain employed front wheel brakes. There was a tendency to rib the drums of internal brakes, or to carry ribs on the shoes in the case of external brakes, a good example of this being found on the Renault. A compensating mechanism was found on about half the chassis, and in a few cases—Renault and Lion-Peugeot—a differential mechanism was employed to transmit equal braking effort to the road wheels. Wire wheels were only represented on 6 per cent of the continental products.

Chain drive for the camshaft or shafts and the magneto shaft was employed on the following makes: La Buire, Gregoire, Aster, and Sizaire-Naudin. Ball-bearing crankshafts were found on motors presented by Bozier, Darracq, Delage, Hispano-Suiza, Pipe, Saurer, Sautter-Harle, and Turicum.

NO TAX SUGGESTED

Des Moines, Ia., Feb. 12—Iowa good roads boosters may favor a tax on cars but at their annual meeting here recently they failed to make any recommendation to the Iowa state legislature which would bring about such a law. Dean W. H. Raymond, of Iowa City, in a paper before the conference on road maintenance urged that a tax on motor cars and narrow-wheeled vehicles be recommended, as did several other speakers, but when the resolutions which outlined the legislative program were adopted there was nothing in them about a motor car tax. About 350 good roads men were in attendance at the conference. The resolutions as adopted were as follows:

Iowa bought 10,392 motor cars in 1910. This was the figure given out by Secretary of State W. C. Hayward, with whom every car used in the state must be registered. The number is by far the largest ever sold in a single year in Iowa. Des Moines dealers who have watched the business closely are authority for the statement that fully three-fourths of the total number of cars sold went to Iowa farmers. Every car registered paid a license fee of $5, and in addition to the 10,392 privately owned cars there were 663 owned by dealers who paid a license fee of $10, so that the state is richer by about $60,000 for the motor car business done in the state this year.

On the basis of the orders already placed for 1911 cars the local dealers estimate that 12,000 cars will be sold in the state during 1911.

TAXICABS IN LONDON

Washington, D. C., Feb. 13—John L. Griffiths, United States consul general in London, has made the following report on the taxicab situation in the English metropolis, which is published in the Daily Consular and Trade Reports.

Chauffeurs receive 25 per cent of the gross receipts of the cabs, as registered by the taximeters, but they pay for the gasoline used. A daily settlement is made with them. All public motors are fitted with taximeters. The fares are as follows: Not exceeding a mile or for a period of time or a journey not exceeding 10 minutes, 16 cents; exceeding a mile or 10 minutes, for each quarter of a mile or period of time or journey not exceeding 2½ minutes, an additional 4 cents, and the same charge for any less period or distance exceeding 1 mile or 10 minutes.

Taxicabs generally are licensed to carry four persons, and for each additional person beyond two there is an exclusive charge of 12 cents for the whole journey, however long it may be. The charge for two persons is the same as for one person. Two children under the age of 10 years count as one person. Luggage, whether the taxicab is hired by distance or by time, 4 cents for each package carried outside. For each bicycle, child's mail cart, or perambulator, 12 cents.

Ranks or stands for taxicabs are conveniently located all over London. At many of these stands are shelter houses provided with a telephone, so that nearby residents can order a taxicab by telephone. If there is not an easily accessible shelter house, the order can be given through the district messenger office. In the west end residential quarter and in many other parts of the city the householder has a whistle which is blown once for a taxicab, and it is surprising how quickly the response comes.

There are three reasons why taxicabs are used so generally in London: The comparative low cost of hiring, the multiplicity of vehicles and their judicious distribution throughout all sections of the city, and the saving of time. A person is tempted, by reason of these conditions, to use a taxicab instead of any other form of public conveyance. Two persons can travel in London in a taxicab, starting in the heart of the city where traffic is most congested, and go a distance of fully 3 miles for about 75 cents, and for a similar sum a longer distance through less frequented parts. A gratuity of 4 to 8 cents, according to the distance traveled, usually is given to the driver.

Taxicabs complete cost £350 to £400 ($1,703 to $1,946) each, according to chassis, and whether two-cylinder or four-cylinder, and according to the style and finish of the cab body. Most of the taxicabs are about 8 horsepower, and the annual license for such power is $15.30.

Large concerns, which have had years of experience with the horse as well as with the motor-cab situation in London, are doing a very successful business, but smaller concerns, with less experience, are not doing so well. The motor cab is rapidly displacing the horse in London.

BAY STATE ROAD MEN MEET

Boston, Mass., Feb. 11—With the mayors of three cities, all the members of the Massachusetts highway commission, engineers from Maryland, New Hampshire and the Bay State commissions, and a number of other men prominent in the work of keeping the highways in shape on hand, the annual banquet of the Massachusetts Highway Association held here yesterday proved a big success. There were more than 200 present, and the members listened to several good addresses on highway maintenance. The officers elected for the coming year were Harold Parker, president; James H. Sullivan, vice-president; John A. McCarthy, secretary; C. A. Brown, treasurer; C. B. Cutler and F. H. Richardson, directors.

CARNIVAL FOR THE CAPITAL

Washington, D. C., Feb. 11—Tentative plans for a motor car carnival to be held early in the summer were made by the board of governors of the Automobile Club of Washington at its last meeting. The carnival will be held at night and it is planned to make it the biggest thing of the kind ever held here. The board elected Elliott P. Hough secretary-treasurer of the club in place of W. Hamilton Smith, who was unable to serve.

The Readers'

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

THE LINCOLN WAY

WEST LAFAYETTE, IND.—Editor Motor Age—Will Motor Age kindly give me some information through the Readers' Clearing House columns as to what became of the project to build the Lincoln Way from Washington, D. C., to Gettysburg, Pa.? I understood there was an appropriation of $50,000 made at the last session of congress for a preliminary survey. Is that correct, and if so, what has been accomplished?—W. J. Snoddy.

The matter of the Lincoln Way is still a live issue. There are now pending in congress two bills, one providing for the immediate construction of the road, and the other for the appointment of a commission to erect an ornamental building in Washington as a memorial to Lincoln.

The general plan of the road is as follows: It should be a double roadway scheme with a greensward 50 feet wide in the middle between the two roadways. It is suggested to have flower gardens on this middle strip. The roadways are to be 50 feet wide. Outside of the roadways are to be double track trolley lines, one for express trains, the other for locals. Bordering each side of the roadway outside of the trolleys would be rows of tall trees.

The estimated cost is $3,000,000. In order to complete the project an organization known as the Lincoln Memorial Road Association of America has been formed, with Leslie T. McCleary executive secretary, Washington, D. C. So far as Motor Age knows there has not been any appropriation for the construction of the road made as yet.

HORSE VS. THE MOTOR CAR

Boonville, Mo.—Editor Motor Age—I have heard several arguments and also have read, in Motor Age, several articles in regard to the relative expense as to care and operation of commercial trucks as compared with horse and wagon, but I have heard little in regard to the relative cost or upkeep of a motor car as compared to a horse and buggy used for pleasure.

Last March I received my Chalmers 30 roadster which I purchased some time before for $1,700. As this is neither a high-priced car or a cheap car we may consider it as an average roadster. So we may neither take a very expensive or a very cheap horse, but one in keeping with the price of the car, which I believe we may value at $350 for horse, buggy $200 and harness $50. Since our roads are just plain dirt roads, with occasionally a rocky hill, as one may find in central Missouri, I figure the depreciation on the car at about 10 per cent, also on the horse and buggy. I also will say in advance of the figures that I consider the labor on the horse and buggy to be twice that on the car, as during times when the roads will not permit the use of the car it requires no attention whatever, whereas the horse needs daily care, such as feeding, grooming, etc., whether in use or not.

Now, as I have kept accurate account of expenditures for my car I think I can show that the motor car is the cheaper of the two; notwithstanding the fact that the average person considers a motor car ride more pleasure than a buggy ride. I submit the following figures:

MOTOR CAR EXPENSE

Depreciation of car at 10 per cent	$170.00
Interest on investment at 6 per cent	102.00
Gasoline fuel, 265 gallons	38.10
Lubricating oil, 6 gallons	3.00
Grease, 50 pounds	6.75
Lighting expenses, electric throughout	8.00
Parts broken, lost, etc	2.15
Total	$330.00

HORSE AND BUGGY EXPENSE

Depreciation of above at 10 per cent	$ 60.00
Interest on investment at 6 per cent	36.00
Feed and supplies at $10 per month	120.00
Labor at $6 per month	72.00
Shoeing for 1 year	12.00
Total	$300.00

OTHER STATISTICS

Distance traveled by car	3,100	miles
Average speed of car	12	miles
Service of car in time	258.3	hours
Cost per mile for car; two passengers	10.6	cents
Cost per passenger-mile for car	5.3	cents
Distance traveled by horse	1,550	miles
Average speed of horse	6	miles
Service of horse in time	258.3	hours
Cost per mile for horse; two passengers	19.3	cents
Cost per passenger-mile for horse	9.6	cents

I trust that this will be of sufficient interest to some of the readers of Motor Age so that they will send in their figures in regard to upkeep; and in that way we may be able to see how we motor car enthusiasts are working, not only as to the point of pleasure, but as to the point of economy as well.—Fred Sombart.

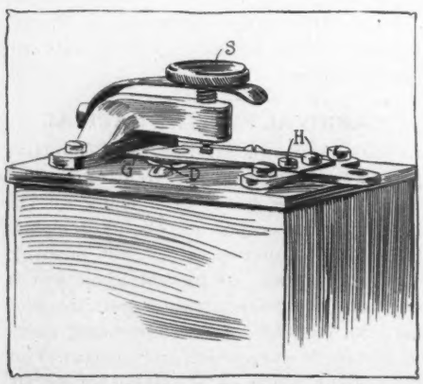


FIG. 1—ADJUSTING KINGSTON VIBRATOR

ADJUSTING VIBRATOR SPRINGS

Egbert, Wyo.—Editor Motor Age—Will Motor Age through the Readers' Clearing House tell me how to adjust the vibrator springs on a four-unit Kingston spark coil, without the use of a coil current indicator? I am using dry cells and do not get the mileage I should. I have been running with springs screwed down medium tight.—J. E. Bauman.

In order to get the best mileage from your dry cells it is necessary that the adjusting screw S, Fig. 1, should be screwed down onto the spring G no further than is absolutely required to produce a good spark, for the greater the tension on the spring the greater the consumption of battery current. To adjust the coil, first see that the points of the spark plugs are spaced about 1-32 inch or a trifle less, and that all are equally spaced. Next screw the adjusting screw S all the way up, so that its contact point does not touch the contact on the spring, and see that the contact surfaces of both points are clean and in good shape.

With the contact screw all the way up the armature disk D on the under side of the spring G should rest suspended about 1-32 inch above the end of the core. If it does not the holding screws H should be removed, the spring removed and bent slightly in the required direction, and then replaced. Following this the switch should be closed and the adjusting screw S should be screwed down slowly until the spring G begins to vibrate. The motor then should be started and tested, each cylinder separately, and the contact screw of the working cylinder regulated a trifle. If regulation does not improve the action of the cylinder turn the screw back to the original position. Testing is facilitated by holding the contact springs of the other coils down with the fingers of one hand while manipulating the screw of the working coil with the fingers of the other. One often is apt to try and make the cylinders run evenly by adjusting the coil, when the irregularity is due to leaky valves, poor carbureter adjustment and other causes.

IDEA IS CORRECT

Sioux Rapids, Ia.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1. By chart show the manner in which the reverse speed is obtained. I understand how the gears mesh in the forward speeds, but do not understand how a reverse motion is obtained without using a set of three gears.

2. Also, what benefit is it to an individual living in the country where he is not in easy touch to any large center to belong to the American Automobile Association. I understand they are working for good roads and all such that is a benefit to motorists in general, but is there any way in which membership in the order is of any or could be of any special benefit to the individual?—Reader.

Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

1. A chart is not necessary to illustrate the reverse speed because you have the correct idea, because a third gear is introduced between one gear on the counter shaft and one on the mainshaft. It is this intermediate gear which gives the reverse direction.

2. The main object of individuals belonging to the A. A. A. is that they can lend their efforts to whatever good roads legislation comes up. Every individual, no matter where he resides, can have some influence with the representative of the legislature or senate in his district.

THREE-SPEED PLANETARY

Attica, O.—Editor Motor Age—Through the Readers' Clearing House will Motor Age state if it would be possible to make a planetary transmission with three speeds forward and reverse. Of course, high gear would be direct. What is the opinion of Motor Age relative to this and would the idea be practical?—A Subscriber.

A planetary gearset with three forward speeds has been used, but every concern using the idea has discontinued it, the exact reasons not being known. A gearset of this nature will operate and is quite practical, as has been demonstrated.

WIRING FOR TWO SETS OF PLUGS

Elma, Wash.—Editor Motor Age—Will Motor Age through the Readers' Clearing House give me the best way to wire a car for high-tension magneto and storage battery using two sets of spark plugs? Can it be arranged so as to use one switch on coil box without injury to the coil or is there danger of injuring the magneto when the battery current is switched on?—Subscriber.

Two independent high-tension ignition systems can be arranged so as to be controlled by a single switch, and most of the manufacturers of ignition appliances make special switches for this purpose. Several makes of cars employ such switches and the Pierce-Arrow and Peerless cars may be taken for examples. A wiring diagram of the 1911 four-cylinder Peerless car is shown in Fig. 2. The system is what is known as the double-jump spark type, which comprises a complete battery system and a complete magneto system, each being absolutely independent of the other. The main parts of the battery system are the battery, where the current originates, the commutator, which regulates the time of each explosion, and the coil, where high-tension current is induced before going to the spark plugs in the cylinders.

The battery system consists of a 4-volt storage battery located under the trap door in the tonneau floor. Two wires lead from the battery to the coil. The one attached to the battery post painted with a red cross leads to a terminal marked with a cross + on the coil box on the dash; and the second wire leading from the battery to the coil terminates at the outside right-hand hinge B on open coil box, which has a lead to the switch located on the coil-box cover. A ground connection from the switch is made through leads to the left-hand hinge of the coil box, to the timer column and to a brass plate on the rear end cylinder. The ground connection completes the battery circuit through individual segments of the commutator, and the primary windings of their respective coils, all of which are internally connected to the post marked with the cross + on the coil box.

Heavily insulated wires are used in the secondary circuit, which lead from posts on the coil box marked B1, B2, B3 and B4, to the terminals on the rear end of the manifold wire bar marked 1C, 2C, 3C and 4C. From these terminals at the rear end of the manifold bar, internal wires conduct the current to terminals arranged along the top of the bar, opposite which similar marks are to be found; and flexible cables communicate between these terminals and the spark plugs. The bar is plainly marked C for battery or coil system, and M for magneto system, and the current therefore may be easily traced from the corresponding letter and number on the manifold bar. A special switch is located on the coil box, there being four marked points to which the handle may be turned. When the indicator points to O the switch is off, when at B the battery system is in circuit, when at M the magneto system is in circuit and when at BM the battery and magneto systems both are in circuit.

A general wiring diagram of a double high-tension ignition system, such as is now employed on a number of makes of motor cars, is illustrated in Fig. 3. The double high-tension or jump spark ignition system indicated consists of two independent jump spark systems with a simple switch design for both systems. It will be noted, however, that this switch will not permit of both systems being used at the same time, so that where it is desirable at times to use both systems simultaneously a special switch, obtainable from any of the large ignition appliance makers, or two separate switches, must be used. The special switch which permits the use of both systems at the same time is not used in this illustration because of its more complicated con-

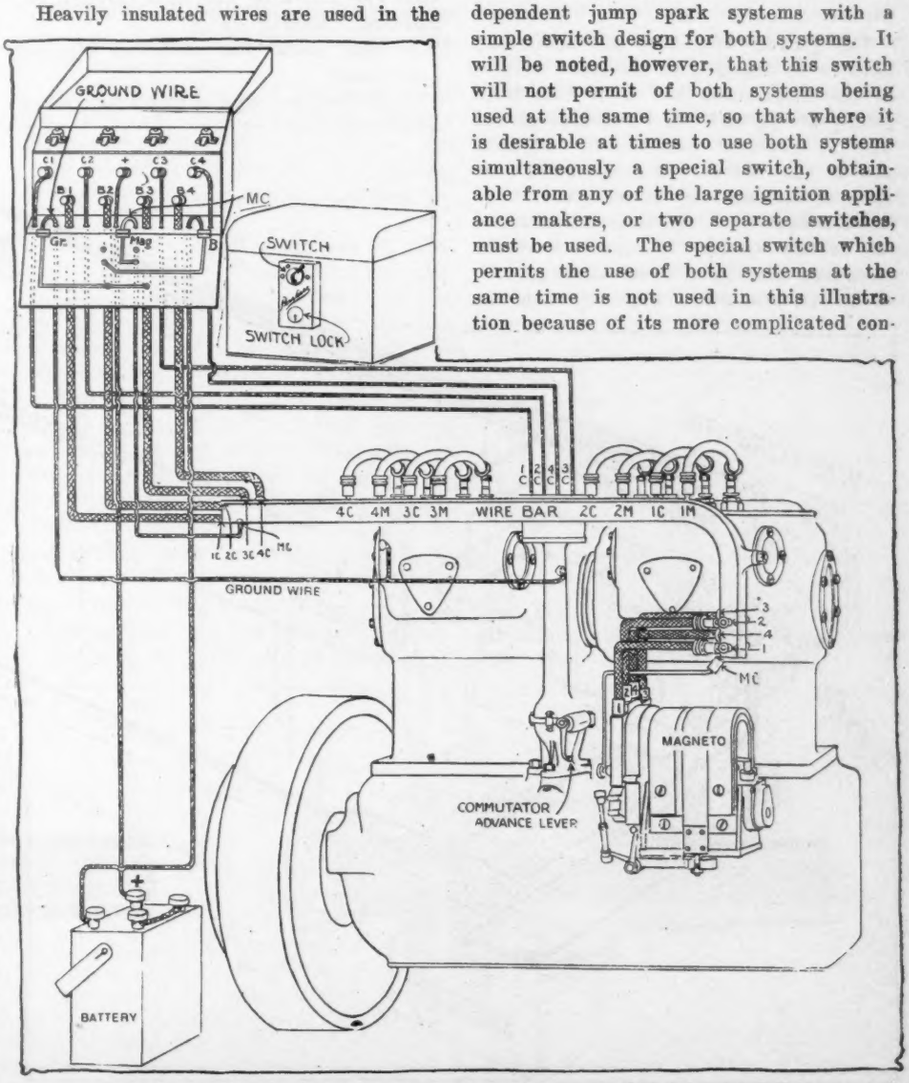


FIG. 2—WIRING DIAGRAM OF THE 1911 FOUR-CYLINDER PEERLESS

struction, it being more apt to confuse than to enlighten. The battery system in this diagram comprises the battery, the four-unit vibrating coil, the timer, part of the switch and wiring connections. The magneto system includes only the high-tension magneto, part of the switch and the two wires connected to the magneto side of the switch.

An effort has been made to make the switch and wiring connections as plain as possible so the circuits of both systems might be easily traced. In the battery system, when the switch lever is moved over to the battery side, the current flows from the positive pole of the battery marked with a cross, through the wire W to a terminal on the coil; an internal wire indicated by the dotted line D leads from this terminal to a contact point P of the switch; the current then passes on through the switch lever L to the contact point C, and through an internal wire to one end of the primary winding of each coil unit, as indicated by the dotted lines E. Passing through the primary windings of one of the coil units, the current flows on to the timer, through the revolving segment of the timer, and back to the battery through the ground wire G.

The ground wire does not necessarily have to be attached to the timer as it is in the illustration, but it is considered good practice; and often an extra ground wire is employed between the negative pole of the battery and a nut on the engine, as indicated by dotted line N. In the secondary or high-tension circuit of the battery system, the one end of the secondary winding of each coil is grounded on the primary of the coil, while the

other is connected to a terminal on the bottom of the coil box; a heavily insulated cable communicates between each of these terminals and the respective spark plugs. The engine fires 1-3-4-2, and it will be noticed that the wires are arranged accordingly. The magneto wiring system is more simple, the wires to the spark plugs being arranged according to the firing order of the cylinders, and the wires to and from the magneto side of the switch being used merely to ground the primary current of the magneto and thereby prevent the generation or induction of its secondary, thus cutting out the sparking of the magneto system.

ORIGIN OF SIX IN AMERICA

Chicago, Editor Motor Age—Kindly answer the following questions through the Readers' Clearing House:

1—How much play should a steering gear have?

2—Is there any way of repairing cracked Rajah porcelains so they can be used again?

3—What American motor car manufacturer first made six-cylinder cars? When?

4—Describe the universal joint that is used on the 1910 Cadillac 30.

5—I have a set of dry batteries which are practically new. When putting the car up for the winter would it be a good plan to disconnect and remove them?

6—What was the fastest time made by a Cadillac 30 and where was it made?—Subscriber H. F.

1—There should be no play in the steering gear of a motor car, but that is an ideal condition which has never as yet been reached by the makers of motor cars or steering mechanisms. Owing to the many connections in a steering mechanism, it is almost impossible to eliminate all lost motion, and from 2 to 4 inches of the steering wheel circumference is considered a very reasonable amount of play. There are cars however with less.

2—The most practical way to treat cracked porcelains is to throw them away, or destroy them so that they will not be used again in an effort to effect a repair. Porcelains can be more easily replaced by new ones than repaired.

3—Claim is made, and few dispute it, that the first six-cylinder motor car made in this country is the idea of Hinsdale Smith, of the Springfield Metal Body Co., Springfield, Mass., a concern which originally made metal cornices. Mr. Smith built the engine in 1904 and at that time it is said did not have enough money to buy a body for the car. Because of this lack of finances, Smith constructed a metal body for the car which, by the way, is said to have been the origin of the metal body business in this country. Frank Duryea of the Stevens-Duryea company saw

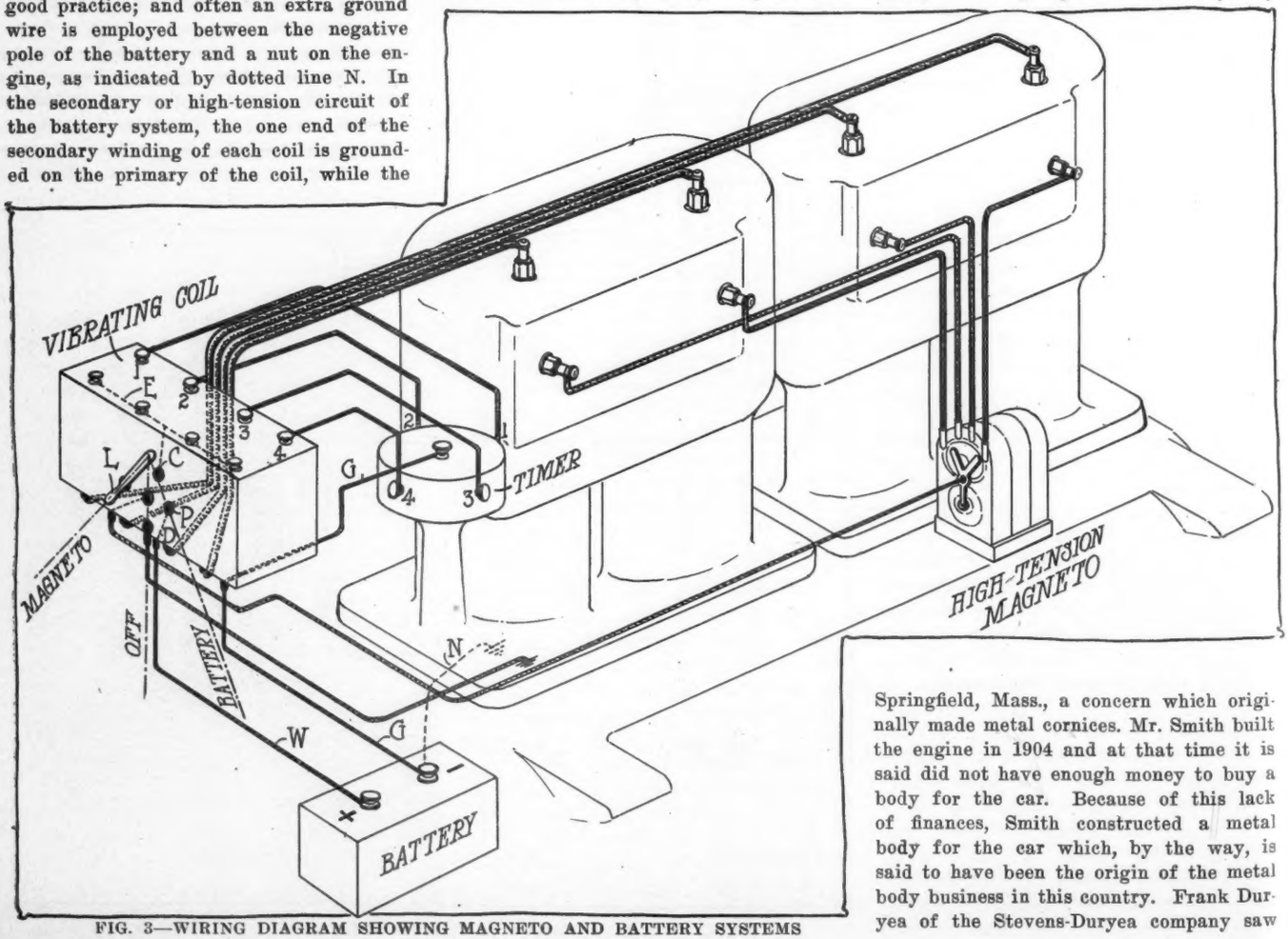


FIG. 3—WIRING DIAGRAM SHOWING MAGNETO AND BATTERY SYSTEMS

Smith's car in operation on the road, and through his endeavors the Stevens-Duryea company put out this first six-cylinder in the fall of 1905. Hardly had the new Stevens been out, than Henry Ford took a liking to the six and the six-cylinder Ford was introduced to the market in 1906, being followed a few months later by the National six and Pierce six.

4—There are two universal joints in the transmission system of the 1910 Cadillac, one in front of the change gearset and the other behind it at the front end of the propellor shaft. Both are of different design. The one between the clutch and gearset is comprised of two slotted yokes and a floating cross-piece having four square arms disposed at right angles to each other. The arms of this cross-piece rest in the slots of the yoke arms in which they are free to slide, one of the yokes is secured to the clutch sleeve and the other to the transmission shaft. The rear joint consists of two yokes, one of which is secured to the transmission gearset shaft and the other to the end of the propellor shaft. Near the end of eack yoke arm there is a short integral pin or stub-shaft disposed outward at right angles to the transmission shafts. These pins are bushed and rest in a split ring, the halves of which are bolted together to complete the joint assembly.

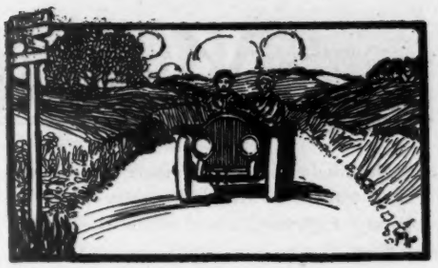
5—Yes, it might be advisable to remove the batteries and store them in a dry place to prevent possible short circuit; but you might just as well leave them on the car and simply disconnect the wires.

6—Motor Age has no official record of the speed of the Cadillac car, as it did not participate in any of the big speedway events or road races last year.

NONE IN AMERICA

Oakland, Cal.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly advise me if there is such a machine on the market as a two-wheeled motor car, and if so is there a suitably equipped plant for turning out such machines at the present time?—E. W. Pierce.

Motor Age has no knowledge of any two-wheeled motor car in America. There are three-wheeled types. In France and in one or two other countries a power plant, consisting of a motor, clutch and



gearbox has been mounted on two wheels and intended for coupling to a truck so as to give a particularly light and powerful commercial vehicle. Nothing of this nature is made in America, so far as Motor Age knows.

DIFFERENCES IN AXLES

Cedar Rapids, Ia.—Editor Motor Age—Will Motor Age kindly explain in the Readers' Clearing House the difference between a semi-floating and a floating axle?—E. S. Boles.

A floating type of rear axle is one in which the wheels have a bearing entirely upon the rear axle casing and no bearing whatever upon the transverse driving shafts, so that the weight of the car is carried entirely by the outer casing of the rear axle or axle tubes, as they are sometimes called, a clutch being used between the ends of the shafts and the wheel hubs to drive the wheels.

A semi-floating type of rear axle is one in which the wheels are secured directly to the transverse driving shafts of the rear axle, these shafts not only serving to turn the wheels, but also to support the weight of the car.

A floating type of rear axle is illustrated in Fig. 4, C representing the axle casing, H the hub of the wheel, S the end of the spokes of the wheel, and B the bearings. It will be noticed that the wheel bears directly on the casing C and is held by the nut N. The driving shaft F has a flanged end G which forms a clutch that meshes with the outer edge of the hub H, the depth of the notches in the clutch and hub being represented by the dotted lines D. The clutch and shaft are held in place by the hub cap, and in this type of rear axle construction the transverse driving shafts F on either side of the driving gear and differential mechanism may be pulled out of the axle by simply removing the hub cap and without removing the wheel. Thus the differential and driving gear unit may also be removed from the floating type of axle without removing the axle from the car.

In Fig. 5 a semi-floating type of rear axle is shown. In this construction the wheel is attached directly to the transverse driving shaft and secured thereon. The driving shaft in this case not only serves to propel the wheel, but it also supports the weight of the car. The hub H of the wheel in this illustration is a snug fit on the end of the transverse shaft F and the Woodruff keys K and the nut N serve to secure the wheel thereto. The hub cap HC is not absolutely necessary in this construction, as it merely serves as an ornament and to protect the nut N from being damaged by rust, bumps and other road hazards.

CHEVROLET'S RECORDS

Evansville, Ind.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1—Are there any records still standing that were made by Louis Chevrolet in the Buick?

2—Has Louis Strang quit racing entirely?

3—Is there any particular reason why southern Indiana is not included in the Glidden tours? Is it too hilly, or are the roads not spectacular enough for the motorists?—E. A. R.

1—The American Automobile Association credits Louis Chevrolet with holding 150-mile and 200-mile 301-450 class speedway records, the former at 2:05:02.17 and the latter at 2:46:48.47, both made on the Atlanta speedway. He also holds the 20-mile at 17:10.7 in the 231-300 class, made at Atlanta, and the 5 and 10-mile in the 161-230 class—4:35.47 and 8:55.4, made at Indianapolis.

2—Louis Strang is now captain of the Case racing team and will race this year in many big events.

3—The Glidden tour has passed through Indiana several times, notably in 1908 and 1909. The southern end of the state is not too rough, but up to the present the tours have passed along main outer-city routes and so has not gone farther south than Indianapolis.

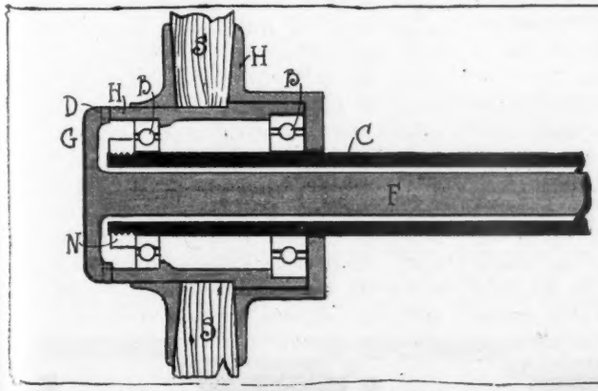


FIG. 4—FLOATING REAR AXLE

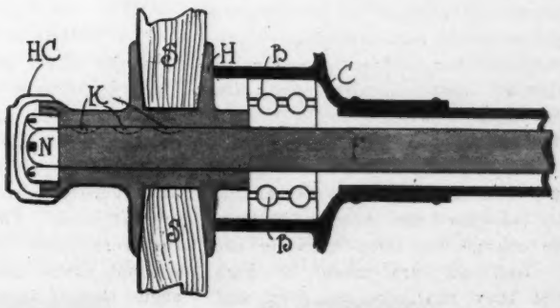


FIG. 5—SEMI-FLOATING REAR AXLE

STATUS OF SHOCK ABSORBERS

JERSEY CITY, N. J.—Editor Motor Age—The following is a paper which was presented by me at the annual meeting of the Society of Automobile Manufacturers held recently in New York city:

Shock absorbers were unknown prior to 1900. In that year I returned from France from a protracted visit, and the motor car industry still was in its infancy, but considerably further advanced in France than in this country. With Mr. Truffault I had gone into this subject extensively, realizing how essential some restraining device was to the springs of the car as they were then constructed. Mr. Truffault had applied the basic principle of the shock absorber to the front fork of a motor cycle. His idea as to its application to a motor car involved great complications and made a radical change in the suspension of a motor car. I looked at the matter more broadly and was responsible for the three-point friction device as it is used on the majority of motor cars today. This is the explanation of the name—Truffault-Hartford.

Mr. Truffault applied it to a spring fork of the motor cycle, and I made it feasible for the motor car. About the year 1900 we applied the first set of shock absorbers to a small runabout.

Convincing the Maker

While I convinced myself and my friends of the absolute necessity of our device, the manufacturers were too much engrossed in building an engine that would enable a man to spend more time in his car than under it, to be diverted long enough to take up the question of improving the riding qualities. In those early days a man was lucky if he could keep his car going at all, and if he got home without difficulty he considered himself fortunate no matter to what physical discomforts he had been exposed. It was not until Leon Thery won the Gordon-Bennett cup in 1903 and described his ability to defeat cars of far greater horsepower by the fact that his car was equipped with our shock absorbers, which enabled him to maintain high speed over all conditions of the road, that our device began to receive recognition. Since that time its progress has been continuous, and at the present time we are equipping almost all the best cars manufactured in this country and abroad.

Springs of motor cars which were primarily intended for at least comparative high rates of speed involve conditions not found in horse-drawn vehicles or railroad cars, although the general construction of the spring is practically the same. Therefore, while conditions as far as the vehicle is concerned are widely different, but little change has been made in the springs. Railroad cars travel at high speed, but they run upon an even and

Manufacturers'

comparatively unresistant roadway. Horse-drawn vehicles, although built for the ordinary highways over which the motor car must travel, are rarely calculated for more than moderate rates of speed. Railroad trains therefore must contend against a maximum speed over a minimum road roughness; while horse-drawn vehicles, on the other hand, have only to provide against a maximum roughness with a minimum speed. When we come to the motor car we have to provide for a maximum speed as well as a maximum road roughness.

Spring Essentials

To be thoroughly serviceable a spring should possess two essential qualities in due proportion—resistance and resilience. That is, a spring should move from its idle point very quickly, and should be so constructed that under unusual stress and strain heavier and stronger portions of the springs should be brought into play.

When we first began to apply shock absorbers to motor car springs we found a great many springs that were so stiff and heavy that the shock absorber practically was useless as applied to them, but gradually the spring makers have increased the flexibility of the springs until now there are several manufacturers who are turning out cars with springs of extreme flexibility combined with shock absorbers, which are giving almost ideal results.

Speaking broadly, to obtain an extremely flexible spring it should be built of a large number of thin leaves, say twice the number that is in the ordinary spring. The top leaf should be of the ordinary thickness, as this has to carry the bearing which attaches it to the shackle or frame. By making three or four of the lower leaves a little heavier and placing them at a different angle, they will be brought into play under the stress of a heavier load and rougher roads. A spring so constructed would be practically useless on a motor car to be driven at high speed without the use of shock absorbers, but this is just the point that I want to emphasize here, that shock absorbers permit the use of a very flexible spring.

Pay Attention to Springs

If the motor car manufacturers would equip their cars with springs, such as I have described above, and would depend on the shock absorber to control them, we would get riding qualities in cars that have hardly been dreamed of up to the present time. The trouble is the manufacturers build the springs to be used without shock absorbers, and they would argue that if they built such a spring as I have described that it would not last on a car a mile over a very rough road, because its extreme flexibility would allow the car to carry the top leaf far past its normal limit and to the breaking point. It is one of the offices of the shock absorber to keep the spring, no matter how great its flexibility, within its normal working limits, and as long as the shock absorber is working it is practically impossible to break a spring.

Some critics who are antagonistic to shock absorbers have argued that they stiffen the springs. I will give you an illustration and you can judge for yourself as to how much this stiffening amounts to, and how little increased flexibility in building the spring would be necessary to compensate for this.

Say the suspended portion of a car weighs 4,000 pounds, put 1,000 pounds of passengers in this car, and we have each spring supporting a weight of approximately 1,250 pounds. The friction on the shock absorber measured at its point of attachment to the axle and frame, the same points of attachment as the spring itself, is only about 30 pounds, which is all that is necessary to control this spring. This is only a trifle over 2 per cent of the carrying load of the spring, and I am sure this will be a great surprise even to those antagonistic critics.

Lose Sight of the Idea

Many copies of the original invention that have come upon the market have missed the real idea of the shock absorber entirely, and as a rule are not really as good as a rubber bumper and a strap, for they limit the play of the spring; and to obtain easy riding qualities over the roughest roads great play of the spring is necessary.

If some of you have ridden in cars that have been extremely easy riding, if you will examine the same again you will find that they have a spring play of at least 10 or 12 inches. As a matter of fact, in theory, if we made the spring play, say, 6 feet, we could come pretty close to riding across country, taking ditches and stone walls. A little experiment which I will describe to you will probably convince you of the reason why I claim that some of these competitors have entirely missed the idea of the shock absorber.

Put a long, flat piece of steel in a vice and hold one end of it firmly; compress this steel and let it go. It will vibrate hundreds of times until it comes finally to rest. Press some smooth object such as a wooden hammer handle lightly against one edge of this piece of steel and it will come instantly to rest, and the piece

Communications

of steel is transformed from a vibratory instrument into a perfect cushion. This is the real secret of the shock absorber in a nutshell, and if you seriously think this problem out for yourselves after making this experiment, I do not see how you can come to the conclusion that any spring could possibly be devised which could do the same wonderful work as the flexible steel spring combined with the constant-friction shock absorber.

Action of the Device

Rough roads are inevitable, and even when roads are fairly smooth there is a constant spring movement caused by the ordinary crosswalks, car tracks or other obstacles. Crossing these, the car pounds down on the axle, acting like a tremendous hammer coming down as far as the four springs will permit; then comes the rebound, and the springs are taxed to their limit in the other direction; and, therefore, while traveling over rough roads, the springs are constantly contracted and expanded, not slowly and harmlessly, but violently, causing considerable discomfort, to say nothing of the wear and tear on the parts. Of course, one may bring the car to almost a halt, but here, again, comes in another feaure of the shock absorber—the lack of the necessity of constant braking, which always is a strain on the car, and when constantly and violently performed produces great wear on the tires. Not only does the shock absorber save this by reducing the necessity of braking to a minimum, but, when traveling over rough roads at a fair speed with uncontrolled springs, the car frequently leaves the ground—sometimes in front and sometimes in back, and a very prominent manufacturer recently advertised his car going at high speed over an inequality in the road where the four wheels were off the ground at the same time.

Strain on Tires Noticed

Obviously, under these conditions, the return of the wheels to the ground causes a tremendous strain particularly noticeable on the tires, but a strain far more important, but possibly not as noticeable at the time, on the chassis of the car and on all its working parts. The shock absorber is interposed between the body and the axle and acts as an auxiliary to each spring, not for a moment detracting from its flexibility. As the spring action of the car determines its riding qualities, the merit of the device can be readily understood.

I believe it is a matter of record that a very large proportion of all the car troubles are caused from the wear and tear which shortens the life of a car, and this wear and tear is due to excessive vibration caused by the character of the roads and by unrestrained spring action. The racking to which a motor car is subjected in traveling over the ordinary high roads will jar loose in a very short time every nut and bolt in its entire make-up, uncontrolled, but if properly controlled in such a manner as to prevent their violent expansion and contraction there is no excessive oscillation and their efficiency is not in any way impaired. This reduces the racking of the car to a minimum.

Abuse a Great Evil

There is less wear and tear, less bouneing of the wheels; thus prolonging the life of the tires. We think the tire manufacturers concede that it isn't the wear that makes the tire up-keep so expensive, but it is the tear, or, in other words, abuse. In addition to all these, a car is capable of greater speed and there is always smooth running, irrespective of the condition of the roads. There is no lost power, and every atom is conserved, with the attainment of greater and smoother running made possible with a material decrease in the cost of the up-keep.—E. V. Hartford, president Hartford Suspension Co.

CONDITIONS IN THE SOUTH

Detroit, Mich.—Editor Motor Age—While the road conditions in the south are a great handicap to the selling of cars and there are many of its inhabitants who are able to buy motor cars but prefer to still travel about in the horse-drawn vehicle, there are still enough of that class willing to take that chance with the gasoline vehicle. The south is rapidly waking up on the good roads question and as fast as is possible, mile after mile of good roads are being built all over the south.

Almost every town has its small garage and agency and the motor car business is increasing day by day. The entire south is good territory for the medium-priced car, but the territory never has been worked right or hard enough. The car sold in the south must stand up and deliver the goods. The south is not looking for promises—it wants results and the right car will sell and every car sold will sell three more.

The future of the motor car in the south depends upon its performance and each prospective customer will look about him and ask his neighbor who owns a motor car how his stands up and then he will satisfy himself by careful investigation and personal observation. If the result is favorable they will buy and if the article makes good they will boost it to their friends. In the south the motor car will continue to be sold for some years on the recommendations of the owners. "Show me" demonstrations are popular in the south and are potent factors in selling motors cars, and the southerner is slow and deliberate in buying as he is in other things. He is, however, becoming a motoring enthusiast.

The climate plays an important part in the disposal of goods and your southerner never is in a hurry, which seems somewhat strange to your more energetic northern salesmen.

As regards the commercial vehicle in the south there is little or no market at present and the pleasure vehicle must be firmly intrenched before the former is introduced; also the roads must be improved before the commercial vehicle in this territory is even thought of. The south bids fair to ultimately be a great market for the motor car and manufacturers would do well to build their fences slowly and surely in this section of the United States.—C. G. Percival, Abbott Motor Co.

REASON FOR TWO MAGNETOS

Indianapolis, Ind.—Editor Motor Age—In an article entitled "Trends Noticed in the Construction of the Motor Truck" in the issue of Motor Age of February 9 we notice the following comment: "The idea of two magnetos being necessary on a truck has ceased. Indeed, it is only on freak racing cars that double magnetos have had much use."

Inasmuch as the Mais trucks were shown at the Chicago commercial vehicle show equipped with two magnetos we wish to give our reasons for such equipment. Past experience has shown us that battery ignition on a truck, even though used solely for starting and as a reserve system of ignition, is very unsatisfactory, owing to the necessity of frequent charging, rapid deterioration, loose terminals, etc. The fact that every high-grade truck is equipped with two systems of ignition is a proof that the maker does not care to rely solely on a magneto, even though it be of the highest grade of construction.

The Mais truck is equipped with the Eisemann magneto, with automatic spark advance, and although perfectly satisfactory in every way, we recommend the installation of a second magneto of the same type, and our motor is designed to accommodate this, thus giving two separate ignition systems, each with its own set of plugs, etc. By this method we render ignition absolutely certain and, at the same time, are not forced to rely upon batteries should one magneto fail for any reason.—Mais Motor Truck Co.

The Motor Car Repair Shop

IN a repair shop in Chicago are to be found the remnants of a once perfectly good motor. To repair and assemble these remnants into a good motor again will cost from $200 to $300. The cause of the trouble was lack of oil in third cylinder or in the splash basin below the third cylinder; the cylinder had run dry, the piston had seized suddenly, the connecting-rod cap was wrenched off and the crankshaft was bent; then the free end of the connecting rod was struck by the crankshaft, bent almost double, the piston was broken in a number of pieces, the cylinder wall was cracked, a hole was punched in the lower portion of the crankcase, and the upper portion of the crankcase was badly sprung.

A diagnosis of the case leads one to believe that either the lead from the oiler to the splash compartment under the damaged cylinder was clogged up, the operator had neglected to replace the plug at the bottom of the splash chamber after having drained the oil therefrom, or the plug had not been tightly replaced and had lost out, allowing the oil to escape. The result has already been shown, and it came about, perhaps, in the following manner. The lack of oil in the one cylinder compartment caused the cylinder and connecting rod bearing to run warm. They soon became so hot that whatever oil left upon the bearing surfaces was burnt off. Then the heat due to friction became excessive, the babbit metal of the connecting-rod bearing on the crankshaft melted out, the knocking which followed crystallized the bolts of the connecting-rod bearing cap; at the same time the piston in the cylinder was getting hotter and expanding.

Suddenly it seized and would move no further, the momentum of the car and the torque of the flywheel was too great to be suddenly stopped, so something had to give way. The lower end of the connecting rod, which is generally much stronger than the upper end, had been considerably weakened because of the crystallization of the bolts, so the bolts gave way, and the above mentioned damaging results followed. This illustrates the importance of giving the oiling system proper attention.

A Portable Garage Lamp

In the garage and repair shop, extension cords for electric lamps are practically indispensable, and strange though it may seem there are few if any shops that have practical supports for these portable lamps; a wire cage is provided to protect the glass bulb but that is usually the extent of the facilities to be found in even the best equipped shops. With these ordinary extension lamps, the workman is generally required to hold the lamp in one hand while he works with the other, or hang it on the most convenient place about the car when both hands are required for work, and this position is often unsuitable because of the inefficient light and because of the many lamp bulbs that are broken by falling.

Hints for the Amateur

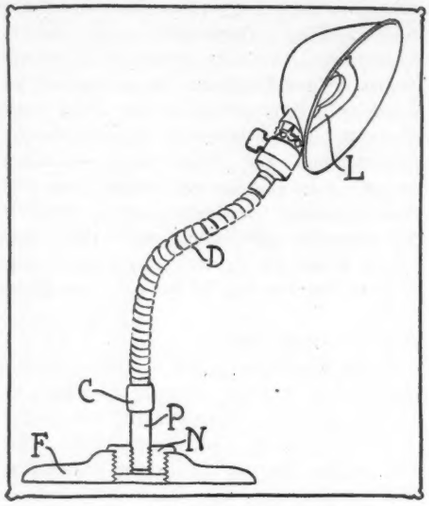


FIG. 1—PORTABLE LAMP

In Fig. 1 a very handy portable lamp for garage and repair shop use is illustrated. It is a home made construction, so to speak, the base F being comprised of a 2-inch pipe flange 8 or 10 inches wide. A reducing coupling N is screwed into this; and into this coupling a ¾-inch nipple with a plain coupling C at its upper end is secured. A piece of flexible conduit D communicates between the coupling C and the electric lamp L, and the electric cord enters through a hole in the side of the nipple P. All of the fittings included in the makeup ofthis lamp are standard and may be assembled without the use of tools. The only preparation of the parts required is the drilling of a $\frac{7}{16}$-inch hole in the side of the nipple P for the entrance of the lamp cord if the ordinary twisted lamp cord is used, and perhaps a ⅜ or ½-inch hole if the more preferable. Heavily insulated extension cord is employed. The hole in the nipple, of course, should be bushed with a wooden or fiber bushing, which also is standard. The flexible conduit lamp, reflector, extension cord and bushing are obtained from the electrical companies or any of the large electrical supply houses; and the pipe fittings from the pipe company or other dealers in supplies.

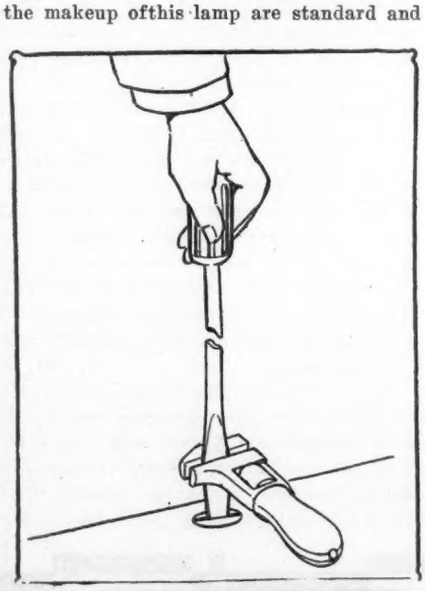


FIG. 2—HELPING THE SCREW DRIVER.

The advantages of this construction are: that it may be placed anywhere about or under a car or chassis; by means of the flexible conduit the lamp may be raised, lowered or twisted into almost any desirable position, the flexible conduit being sufficiently stiff to hold the lamp in any position to which it is adjusted; the reflector concentrates the light on the parts being operated upon, and protects the eyes of the operator; the bulb remains clean and its light unimpaired, because there is no necessity of handling it with greasy hands; it is a cheap, durable and practical outfit, and its price is saved many times over in a short time, because there is a considerable reduction in the breakage of lamps and in the time lost in connection with each breakage.

Assisting the Screwdriver

In the motor car repair shop one often is required to loosen a screw that is so tightly secured that it is quite impossible to loosen it with the leverage of the screwdriver handle. In such cases the operation may be greatly facilitated by carefully applying a wrench to the screwdriver blade as illustrated in Fig. 2, pressing down firmly on the top of the screwdriver with one hand and turning it by means of the wrench. One should be careful in applying power through the wrench, however, for one may very easily put a greater strain upon the screwdriver blade than it is designed to stand, and a broken screwdriver will be the result. This is especially true of a tempered screwdriver.

A little kerosene or gasoline previously applied to the slot and edges of the screw may be also of assistance in some cases, as either of these substances attack and loosen up rust or grease.

It is folly to waste time trying to loosen a screw whose slot has been badly battered up so that a good bite cannot be gotten on it with a screwdriver; in such cases the sides and edges of the slot should be dressed up a trifle with a very thin file, a hack-saw blade or chisel, and the slot deepened a little.

Current Motor Car Patents

Late Ideas of Inventors

NON-SLIPPING Clutch Mechanism—No. 981,010, dated January 10; to James M. Schoonmaker, Jr.—As illustrated in Fig. 1, the feature of this clutch mechanism is the positive clutch members which are comprised of an internal gear or internally toothed cup C secured to the flywheel web B, and the externally tooth gear G which is slidably secured to the shaft T and adapted to slide into engagement with the internal gear C for the purpose of insuring positive non-slipping engagement between the motor and transmission shafts. Except for this positive gear clutch mechanism, the clutch is of a conventional leather-faced cone design, and in operation the friction cone is used to start the car, and when both the crank and transmission shafts have attained the same speed, the positive gear clutch is engaged.

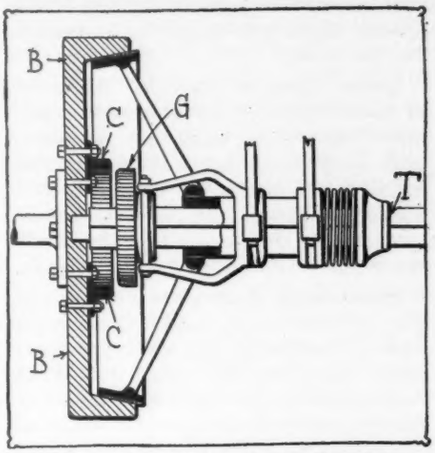


FIG. 1—NON-SLIP CLUTCH DETAIL

New Spark Plug Design—No. 983,737, dated February 7; to Harry Ellsworth Maher, Crookston, Minn.—The spark plug to which this patent relates is of conventional design except that the insulated electrode has a disk mounted on the end of it with a V-shaped groove in its periphery, providing upper and lower flanges which are unequally spaced from the sides of the casing to form two spark gaps, the one acting auxiliary to the other. The construction is shown in Fig. 5, the upper edge W of the disk D being closer to the casing C which forms the ground electrode of the plug than the lower edge L.

Headlights Operated by Pedal—No. 983,629, dated February 7; to Francis J. Madden, Duquesne, Pa.—The dirigible headlights to which this patent relates differ from other constructions recently patented, in that the lamps are not interconnected with the steering mechanism of the vehicle and automatically turned therewith, but may be independently operated by means of a pedal or foot-lever in the foot board, conveniently arranged for the driver. The mechanism comprises, as illustrated in Fig. 2, brackets B secured to each of the side frame members, lamp supports movably mounted in these brackets, and each having its lower end formed with a crank arm. A rod is pivotally connected to each of these arms so that they move in unison, a crank arm projects from one of the supports, and a rearwardly extending reach rod R makes connection between this crank arm and a bell crank operated through a trunnion arm or pedal by the foot of the driver of the vehicle.

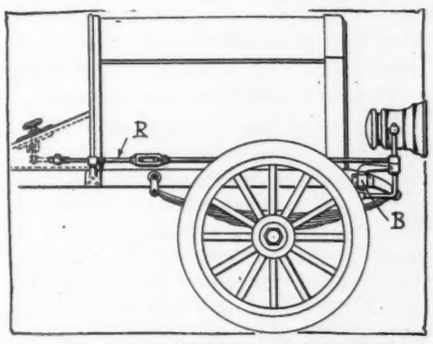


FIG. 2—DIRIGIBLE HEADLIGHTS

Spark Plug Terminal Switch—No. 983,738, dated February 7; to George W. Manville, Towanda, Pa.—As illustrated in Fig. 3, this patent relates to a new type of spark plug connector and switch. The combined connector and switch mechanism is secured to the upper end of the insulated electrode of the plug by means of a nut N, upon which it is mounted. The supporting arm A of the combined connector and switch is of insulating material; the spark plug cable C is secured to the metallic switch suporting arm S, which is attached to the end of this insulating arm, and the switch lever L has an insulated handle H and a spring contact clamp P depending from it, which is designed to grip the ball head of the nut N.

Loading and Unloading Device—No. 982,977, dated January 31; to Ralph L. Morgan, Worcester, Mass.—This patent relates to an apparatus for unloading or removing the removable body of a truck as indicated in Fig. 4. It is a combination of a stationary platform P, a regular truck K adapted to be moved up to the platform P, a pair of tracks T located at the sides of the truck and having their ends extending to the platform, these tracks being adapted to receive the rollers R of the removable body B of the truck, and power operated means M independent of the truck for raising and lowering the tracks T. The device is designed to facilitate the unloading and reloading of trucks where it is not desired to have them idle, as one body can be loaded while the other is on the road.

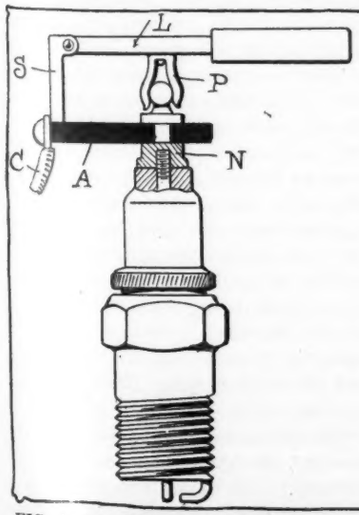


FIG. 3—SPARK PLUG SWITCH

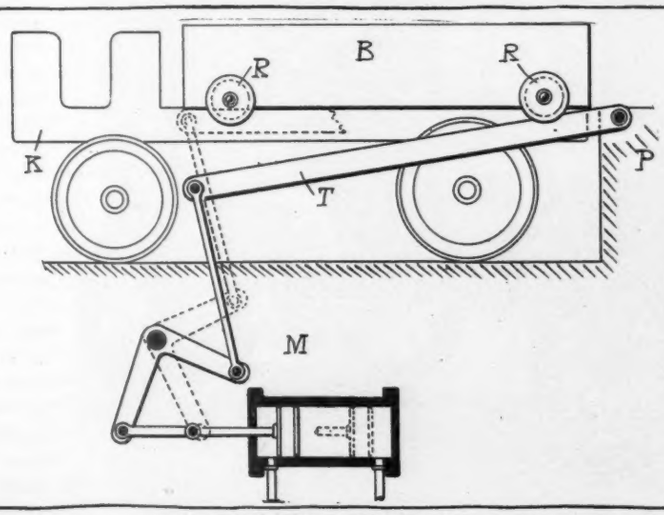


FIG. 4—UNLOADING DEVICE

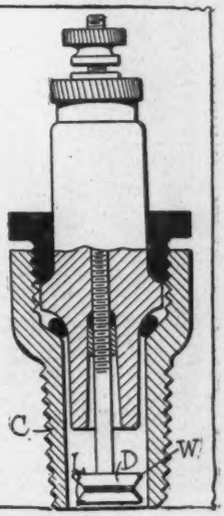


FIG. 5—SPARK PLUG DESIGN

From the

PALMER & SINGER Will Race—Announcement is made that the Palmer & Singer Mfg. Co. will enter the racing game this year. No drivers have been selected as yet by the company.

Case Enters Canadian Tour—Although the entry blanks for the Modern Power Canadian national reliability tour have been out hardly a week, the first two entries have already been received. Cars No. 1 and 2 have been entered by the J. I. Case Threshing Machine Co., of Racine, Wis., whose entry certificates, accompanied by a check for $300, were received on February 8. Accompanying the Case company's entries was also a proposal for the pathfinder privileges.

Cleveland Club Elects—At a meeting of the directors of the Cleveland Automobile Club, of Cleveland, O., officers for the year were elected as follows: Fred C. Wood, president; Harry L. Vail, vice-president; T. P. Cagwin, treasurer, and Harry Johnson, secretary. A committee was named to lay preliminary plans for a consolidation of the company holding the show and the dealers' and manufacturers' organization. It is expected that in the future the club will father shows, contests and other motor events. A big campaign for members will be started at once.

Favors International Highway — The new council of the Montreal board of trade has taken a stand in favor of better roads in the province of Quebec, and an effort is to be made to have the provincial government join with the state of New York in providing a macadamized boulevard from New York to Montreal. The council feels that if the New York legislators can afford to spend $2,000,000 in providing a road as far as Rouse's Point it is the duty of the province of Quebec to carry the road on to Montreal. At present this road is far from good, but if a boulevard is provided from the metropolis of Canada to that of the United States the amount of money which would each year be brought in the province of Quebec would well repay the government for the outlay.

Quebec After a Tax—The city council of Quebec has under consideration a proposition to levy a tax of $25 per annum upon every car owned in that city. Final action in the matter has been delayed on account of uncertainty as to any possible conflict with the provincial authorities in the matter on the subject of jurisdiction.

Texas Doing Something—For the purpose of encouraging and aiding in the work of building good roads in the Texas coast country the Galveston Good Roads Association has just been organized. The following are the officers of the association: Moritz O. Kopperl, president; Maco Stewart and J. W. Munn, vice-presidents; Bartlett D. Moore, secretary; George Sealy, treasurer. J. W. Munn, one of the vice-presidents, is the president of the Texas Automobile Association.

Twin Falls Has a Club—The annual election of officers of the Twin Falls County Automobile Club, of Twin Falls, Idaho, resulted as follows: President, George S. Aldrich; vice-president, L. A. Burson; secretary, Brick P. Kuhn; treasurer, Fred C. Spencer. These, together with J. Benjamin Hall and C. E. Lind, comprise the board of governors for the ensuing year. The Twin Falls club is one of the charter members of the Idaho State Automobile Association, which at present consists of Boise, Twin Falls, Idaho Falls and Montpelier. The clubs at Pocatello, St. Anthony, Weiser, Gooding, Rexburg and Ashton probably will affiliate with the state association this month. Chairman A. G. Batchelder, of the executive committee of the A. A. A., will visit Twin Falls the latter part of February to confer with the state officials.

Pulls 50-Ton Engine—Because of a vexatious delay in receiving carload shipments of Molines, the agent of that car at Portland, Ore., Edward Suiter made a wager that one of the Molines could pull a 50-ton locomotive engine and won his bet. The wager was made with the freight agent of the Soo line at Portland. Mr. Suiter in kicking on the delayed shipments stated that he would have received the goods sooner if one of the motor cars were drawing the locomotive. The freight agent replied that the Moline could not budge the engine and the bet was on. A cable was attached to the Moline and the car walked away with its 50-ton burden without jerking, tugging or spinning its wheels.

Idaho Starts Road Campaign—The first gun in the Idaho good roads campaign that promises to be far-reaching in extent was fired last week when the Twin Falls County Automobile Club, of Twin Falls, made an initial appropriation of $100 for the purpose of dragging a section of roadway near Twin Falls with a King road drag. After the club has demonstrated the efficiency of the drag a more pretentious effort will be made and a road built across the county something after the Iowa plan. The first piece to be worked is in the corporate limits of Twin Falls, and the good roads committee of the club has asked permission of the city council to assume charge of this particular section. The attention of the farmers will be especially drawn to this work and their interest thus aroused.

Canadian Finding—If your car is exceeding the speed limit, even if you are not in it, or even if you think it is in the garage when, instead, the repairer is using it, you are responsible, is the law and you can be fined for exceeding the speed limit. This is the substance of the judgment of Judge Cross in an appeal before the court of kings bench appeal side in Montreal the past week. A prominent Montreal stock broker was summoned some time ago for exceeding the speed limit. The broker set up as extenuating circumstances that he was not in the car, and as a matter of fact thought it was in the garage being repaired at the time. Upon proof being made that a garage employe was actually testing the car after repairing it and that the constables took down his number, Judge Bazin, sitting in the police court, dismissed the complaint. The police magistrate held that a man who had no knowledge of a crime could certainly not have committed it. Judge Cross, however, reversed the judg-

WAVERLEY THAT MADE MIDWINTER PHILADELPHIA-NEW YORK RUN

Four Winds

ment. He cited numerous judgments on the motor vehicles law showing that at any time an owner of a car was responsible in the law for any infractions, whether he had personal knowledge or not.

Touring Obstacle Removed—By the middle of March the many motorists who are in the habit of making the tour between Puget sound and the Oregon country will find removed one of the bars to the pleasant journey with the completion of the state aid road now being built over Carrollton mountain, about 7 miles south of Kelso, Wash. The building of the Carrollton road is not easy work by any means. Out of the 8,000 feet that was driven 6,000 feet was cut off the solid rock. The removal of this stop in Washington on the Seattle-Portland run is just one more step forward in the completion of the trunk line from Canada to Mexico and is similar to other small links which have to be smoothed over before the Pacific highway is made perfect.

Canadian Imports—The trade between Canada and the United States in motor cars is on the increase and in the last fiscal year, closing on December 31, 2,121 motor cars were imported from the United States to Canada valued at $2,474,462, while during the 12 months ending March 31, 1910, 1,457 machines were imported, valued at $1,816,164. This is partly accounted for by the fact that Canadian manufacturers have been exporting a considerable part of their output to India and Japan, thus getting a drawback upon the duty paid on material used in manufacture. The customs figures show that the British manufacturers are not seriously competing in the Canadian market. During the past 8 months only 134 cars valued at $205,519 were imported from Great Britain.

Roads Bill for Illinois—An appropriation of $250,000, the appointing of 102 new officers and the mapping of every road in the state are provisions of a comprehensive good roads bill which State Senator F. A. Landee, of the thirty-third district, will introduce in the Illinois legislature. The Landee bill provides for the creation of the office of county superintendent of roads, to be nominated by the county boards of supervisors, approved as to their qualifications by the state highway commissioners and appointed by the governor. The duties of the new officers would be the making of maps or plats of county roads, pass on the work of the township highway commissioners, attendance at proposed annual state conventions called by state highway commission, these to be schools of instruction; inspection of all roads and bridges and report thereon to state highway commission, recommendations for the improvement of roads and materials, the making of specifications for all road and bridge work outside the limits of incorporated towns and veto on all work of township highway commissioners.

Preparing Speedway—Work has been resumed on the race track and motordome near the Base Line road, some 12 miles from Portland, Ore., where the races will be pulled off during the annual rose carnival in June, 1911.

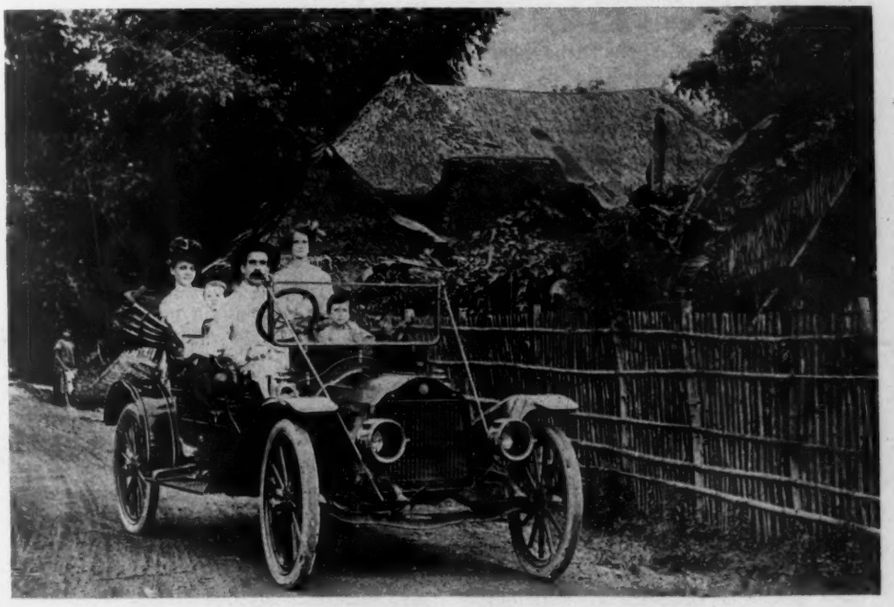
Case Team Recruit—Joe Jagersburger is the third member of the Case racing team organized by Lewis Strang. The team now consists of Strang, William L. Jones and Jagersburger, with the following named assistants, substitutes and mechanics: Larsoneur, Nomicos, Pfeister, Christ Hanson, and Winckler. The first appearance of the squad on the track will be at the New Orleans mardi gras racing carnival. Jagersburger came to America with Harry Harkness in 1903.

Syracuse Club Growing—The Automobile Club of Syracuse, of Syracuse, N. Y., now has 609 members. At the annual meeting held a few days ago the following officers were elected: H. W. Smith, president; A. T. Brown, first vice-president; C. C. Bradley, second vice-president; Forman Wilkinson, secretary and treasurer. The board of directors consists of John H. Valentine, H. P. Denison, W. L. Brown, Alexander D. Jenney and Edward L. Pierce. A resolution was adopted advocating a selection of the route of the state highway between the village of Camillus and Elbridge, leading west through the valley and paralleling the New York Central railroad to the west through the village of Halfway to Elbridge, instead of the proposed road over the West Camillus hill.

Columbus Moving Delayed—Because of delay experienced by the contractors who are building the new addition to the Virginia hotel, the Columbus Automobile Club, of Columbus, Ohio, will not be able to move into its new rooms in the basement of the building before April 15. First indications were that the rooms would be ready for occupancy by March 1, but it was found impossible to complete the work by that time.

Railroad Builds Model Highway—The Chicago, Milwaukee and St. Paul Railway Co. has just made the gift of a model road to the village of Bangor, LaCrosse county. This is the first instance on record of such a gift. The railway desired to lay a double track through the village and eliminate a dangerous grade crossing where several met death. The village presented a strip of the old highway to the railway, which constructed a stretch of model road about ¼ mile in length and some distance from the tracks in return for the gift. The road is regarded as the best piece of macadam construction in the state and is as smooth as asphalt.

Quakers Choose Officers—The fifth annual election of the Quaker City Motor Club of Philadelphia was held at the Hotel Walton and was a harmonious affair, the various officers being elected without a contest. Only in the selection of those to serve on the board of governors was the voting in any way close. The results were: President, L. D. Berger; first vice-president, J. Fred Betz, 3d; second vice-president, Paul B. Huyette; treasurer, Edwin H. Lewis; secretary, A. T. James; board of governors, J. C. Bartlett, M. E. Brigham, Evans Church, Fred C. Dunlap, P. D. Folwell, G. Hilton Gantert, George M. Graham, George E. Potts and W. Moseley Swain.



FLANDERS CAR IN SERVICE ON HAWAIIAN ROADS

Long-Stroke Motors for the Trucks

By Edward A. Myers

EDITOR'S NOTE—Paper read before the Society of Automobile Engineers at its annual meeting, New York, January 11 and 12, 1911.

IN noting the views from time to time of different writers on the subject of length of motor stroke we have been able to find a great diversity of opinion and plenty of claimed advantages in both types of motors, but unfortunately it has been almost impossible to find any lucid explanation of these advantages or disadvantages. They have been given as conclusions and we are expected to accept them as facts without explanation.

In our discussion of the relative merits of the long and short-stroke motors we will treat them from the standpoint of practical experience as well as from the standpoint of theory.

Long-Stroke Efficiency

For the purpose of comparing the work of the short-stroke motor with the work of the long-stroke motor, we call your attention to a 10 by 18. This engine was designed to take the place of the 11 by 15 of earlier type. It weighed about 1,500 pounds less, and was built for 25 horsepower at a speed of 265 revolutions per minute, or a piston speed of 795 feet per minute. Thorough test showed this engine would develop 40 horsepower on a smaller consumption of fuel than that on which the 11 by 15 would develop 22 horsepower. Also that the efficiency of this engine continued to increase as the piston speed increased up to 850 feet per minute, at which speed it proved to develop a horsepower on the least amount of fuel. It is interesting to note that when the bore of the cylinder was reduced the crankshaft and all other parts were correspondingly reduced in size, with a decrease in weight of about 1,500 pounds. After 10 years' service under all conditions it has shown clearly that it is much more durable and costs less for repairs than the shorter-stroke engine.

The Piston Speed

It was shown that the piston speed must be much higher in some engines than in others in order to get the best results, showing conclusively that trying to hold to a given piston speed regardless of whether or not engine is of short or long stroke, large or small bore, is all wrong.

Advantages of Long Stroke

Briefly, I would say that the advantages of a long-stroke motor over a short-stroke are:

1—A motor much lighter in weight for a given horsepower.

2—A motor of longer life.

3—A motor more economical in the use of fuel.

4—A motor requiring less radiating surface for cooling.

5—A motor of smoother running qualities and less noise.

It seems to be the prevailing opinion that the long-stroke motor is of heavier design. Our entire experience has been exactly the opposite. For an illustration, take a 4 by 4 motor of modern construction. It is a bad design, indeed, if any good designer cannot copy it, changing it to a 4 by 5½, making a motor of as long life at an increased weight of from 5 to 10 per cent. In making the change he will get an increase in power of from 25 to 35 per cent at the same number of revolutions per minute. He will not have increased the initial pressure on the piston head, the shock caused by the instantaneous expansion of the gases at the beginning of the stroke, or the pressure on the bearings. Hence there is no occasion for increasing the thickness of the piston head, cylinder walls or other parts.

Piston Speed Efficiency

The advocate of the short-stroke motor will at once reply that he will simply increase the speed of the motor until he gets the same piston speed and will then get the same power. At first glance it seems that he is right from a theoretical standpoint. But such is not the case. Neither is he correct from a practical standpoint. In the first place, the greater the speed of the motor, the more the power required to propel the motor itself. We must not lose sight of the indicated and actual horsepower and the fact that the power required to drive the motor itself must be considered as lost. It should be quite clear that it will require more power to turn the 4 by 4 motor a greater number of revolutions per minute to get the same piston speed as the 4 by 5½. Hence if there were no other advantage, this increased frictional loss would prevent the securing of the same power from the shorter stroke motor.

There is a speed at which every motor will produce the most power for the amount of fuel consumed. It will be found that the actual pull in pounds will increase with the speed of the motor up to a given point, when the pull in pounds will begin to decrease. If the speed is increased beyond this point the motor will continue to develop more power, but not in proportion to the increase in speed; hence, at a greater fuel consumption.

On the other hand, below the speed at which the pull in pounds is greatest, the horsepower is not only less, but the fuel consumption is greater per horsepower developed.

If you test this out fully you will find that the highest point of efficiency is at a higher piston speed on a long-stroke than on a short-stroke motor.

Another reason why you cannot get the same power from a shorter stroke motor by increasing it to the same piston speed as the longer stroke, is because of the impossibility of converting into work the same amount of heat from a given number of heat units. Of this advantage we shall speak later under another head.

Life of Motor

The long-stroke motor of a given horsepower has a smaller cylinder diameter, and, as the initial pressure on the piston head is practically the same in both long or short-stroke construction, if there is no difference in the diameter of the cylinders, it is clear that the actual pressure on the piston head in the motor of smaller diameter and longer stroke will be less than in that of larger diameter and shorter stroke, and as a natural result the shock caused by the quick expansion of the gases at the beginning of the stroke is less in the smaller diameter; the work on the bearings being not so severe. In the short-stroke motor practically all parts, with the exception of the piston, must move faster. This, together with the number of reversals of direction of motion per unit of time, must necessarily mean more wear on bearings, valves, valve-stems and cams.

Valve Grinding Reduced

It is well understood that the intake valve does not require the attention of regrinding the exhaust valve does; the heat of the escaping gases being responsible for the difference. If we can reduce the temperature of the burnt gases as they are permitted to escape through the exhaust valve, which is accomplished with the long-stroke motor, we thereby reduce the cause for regrinding to that extent.

Fuel Economy Greater

From a given quantity of fuel we get so many heat units, the distribution of which we might divide under the following heads:

1—Frictional losses.

2—Loss by reason of heat carried off through the cylinder walls.

3—Loss through the exhaust.

4—Amount converted into power.

In the discussion of this subject of economy in operation we shall consider separately each head under the disposition of heat in the order given.

1—Frictional losses.

If we are correct as to frictional loss above mentioned, this alone would make the long-stroke motor more economical, were there no other losses.

2—Loss by reason of heat carried off through cylinder walls.

It has been stated frequently by very able men that the loss through radiation or through the cylinder walls of a short-stroke motor was less than in the long-stroke motor and that for this reason the former was more economical of fuel. In this opinion we can in no way concur.

This argument is based upon the theory that the stroke being longer, more of the cylinder wall is exposed, and as a result there is more chance for the heat to be carried off through that part of the cylinder swept by the piston. If this were true, the loss would still be less than on the short-stroke motor with the larger bore, for the reason that the compression chamber on the larger bore leaves a greater exposure of wall surface. Again, this greater wall exposure in the compression chamber occurs when the compression is at the highest possible point; while with the long-stroke motor that part of the cylinder wall swept by the piston, by reason of the longer stroke, is not exposed until the pressure has reached the lowest possible point. Hence the loss would not be so great even with an increased wall exposure in the longer stroke.

Radiation Loss Reduced

In order that we may properly understand this, we must get some idea of the capacity of the cylinder walls for absorbing and carrying off heat. Let us assume that we have a proper mixture of gas and air confined in the compression chamber of the cylinder of a properly constructed motor, with all valves closed, no leaks of any kind, piston immovable, compression 60 to 70 pounds, and the charge ignited. Under these conditions it will be seen that no heat can be converted into work, no frictional loss by means of exhaust; in fact, no escape except through the cylinder walls. Let us further assume that when this charge is ignited it will immediately explode and create a pressure within compression chamber of from 300 to 350 pounds per square inch. If we were to ask the man who had not given this matter careful thought, or who had made no practical test of it, how long it would take under such conditions for a sufficient amount of this heat to be carried off through the cylinder walls to reduce the pressure within to 100 pounds, he would more than likely say from five to ten minutes. If we were to tell him that as a matter of fact it will take less than two seconds, he would either not believe it or would at once begin to realize what high piston speed means when it comes to a question of economy. It is thus seen that when we increase the piston speed, there is less time for the heat to be carried off through the cylinder walls, and as a result more of it is converted into work. When this is done by means of increasing the stroke, there is but little frictional increase, and a clear gain in power, with less fuel consumption.

It has also been demonstrated that with the longer stroke the compression can be increased over that of the short-stroke motor, without any of the bad effects or disadvantages of too high compression. Increased compression is another step toward more economical operation.

Exhaust Loss Reduced

It is evident that the further you expand the gases, the less heat will be carried off through the exhaust. Observation of the exhaust alone from a long- and short-stroke motor, both properly constructed, should be sufficient to satisfy the mind that the exhaust gases can be permitted to escape under a lower pressure with the long-stroke moter; a properly taken indicator card will show this clearly.

The advantages here are covered almost completely by the remarks as to loss from radiation through the cylinder walls. If we have less loss through the cylinder walls, we require correspondingly less cooling surface, which means a saving in expense as well as a reduction in weight.

Running Qualities Improved

Smoother running qualities and less noise are secured in the long-stroke motor because of the fact that the initial impulse is much less. The pressure on the piston head is the same whether the motor has a 4-inch stroke or 6-inch stroke, if the diameter and compression in both are the same. If we must use the larger bore, in order to secure the same power, we must expect the natural results of a larger motor, or of a larger cylinder diameter with the same stroke. The noise must necessarily be increased when motor is running at a greater number of revolutions, because of the increased speed of opening and closing valves, and the movement of the other parts of the motor.

Again, it is a well known fact that with the long-stroke motor you secure better mixing and vaporizing of the charge. You can throttle the motor down lower, so that it will pull much more steadily, quietly and smoothly on hills or on slow speed under heavy load. It is not difficult to see that the further the gases are expanded, the less noise will be created by the escape of the exhaust gases; likewise, that exhaust valves will open against less pressure.

Ratio of Stroke to Bore

Many other reasons might be advanced in favor of the long stroke. We have tried to touch upon what we consider the most important. We have not gone into the question of what we consider the best proportion of the stroke to the bore, for the simple reason that so much depends on the work for which the motor is to be used. What may be ideal in one case may be all wrong in another. Where you have a given number of revolutions per minute, as in stationary work, the better practice is to use the longest stroke possible, consistent with a smooth running engine. Where you must have variable speed, the better practice, in our opinion, is to have the stroke such that the piston speed will be at a point showing the greatest efficiency at the number of revolutions per minute at which the motor will be more generally used.

Generally speaking, for motors used for work requiring a variable speed, the smaller the motor, the greater the stroke can be in proportion to the bore.

Carrying the long stroke to the extreme or to the point of what we sometimes call freak construction will only do injury to its progress, but we have had this in every new idea since the creation of man and must expect to see it carried to a point where stroke is out of all proportion to the bore from the standpoint of good construction.

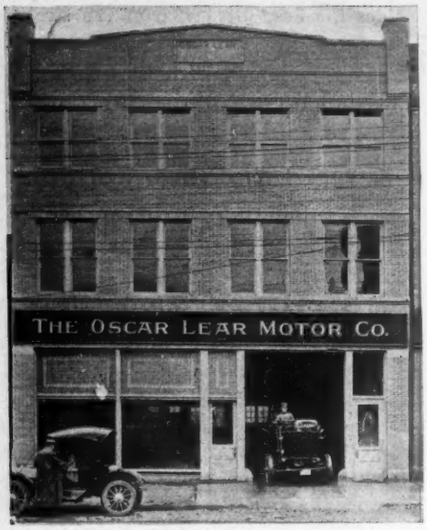
Long Stroke for Commercial Vehicles

In speaking of the proper proportion of the bore to the stroke, depending on the work of the motor, we desire to make it clear that we believe the advantages of the long-stroke motor are much more essential to the construction of good commercial vehicles than pleasure vehicles, because of the wide speed variation. With the truck or commercial vehicle the conditions are different from those of the pleasure vehicle. The governor is now being used extensively on the former for limiting the speed, and a fourth speed is being used in the transmission for increasing the speed of the car when running light. Hence the motor can be operated more nearly at the piston speed at which it will give the most economical results.

Regardless of how far we may go in the future in the increase of the stroke of motors used for pleasure vehicles, we are firmly convinced that the motor with the bore equal or nearly equal to the stroke will very soon be a thing of the past for the truck or commercial car.

Take, for illustration, the 4 by 4 motor to which we have formerly referred. In order to get the best results from a standpoint of fuel consumption per horsepower developed, it would be necessary to run it at a speed of something like 1,400 to 1,500 revolutions per minute. It would be far better practice to increase the stroke so that the desired piston speed could be obtained at something like 1,000 revolutions per minute, and by so doing not only be operating a greater part of the time at the nearest point to the speed where the most power will be produced for the amount of fuel consumed, but with the further assurance that you will have less wear and tear on the motor, giving much longer life.

IDEAS IN TOPS FOR 1911



STORE OF OSCAR LEAR MOTOR CO., COLUMBUS, O.

Among the Makers

ELMORE Capacity Increased—The Elmore Mfg. Co. at Clyde, Ohio, has finished a big addition which will give it three times the floor space which it had in its old No. 1 factory.

Working at Sebring Plant—The Sebring Automobile Co.'s plant, at Sebring, Ohio, is again in operation after a lapse of some weeks, and according to the announcement of the manager more than fifty Sebring models will be put out during the coming season.

Body Concern Changes Hands—The Janesville Carriage Works, of Janesville, Wis., which now builds bodies for passenger and commercial cars, has changed hands and is now owned by the Buchholtz brothers and the Buchholtz estate. The capital stock has been increased from $15,000 to $30,000.

Planning Merger in Findlay—An attempt is being made to join the forces of the Findlay Motor Co. with the Lockport Stamping Co., of Lockport, N. Y., moving the latter plant to Findlay, Ohio, and constructing an immense building for its reception. The removal of the company to Findlay will entail the raising of about $75,000 upon the part of the citizens of the city, the company bringing cash to the amount of $35,000 and about $40,000 worth of property. W. A. Babit is president of the latter company.

May Locate in Wilmington—The Twombley Motor Co., of New York, is considering the advisability of establishing a plant in Wilmington, Del., for the manufacture of motor cars.

Lozier Branch in Cleveland—The Lozier company has opened a branch at 6010 Euclid avenue, Cleveland, Ohio, with W. H. Kirkpatrick as manager. Plans have been drawn for a new building for a service factory department. The same plan of Lozier service in vogue in the company's different branches will be given to Cleveland. A. C. Weaver will be connected with the sales department.

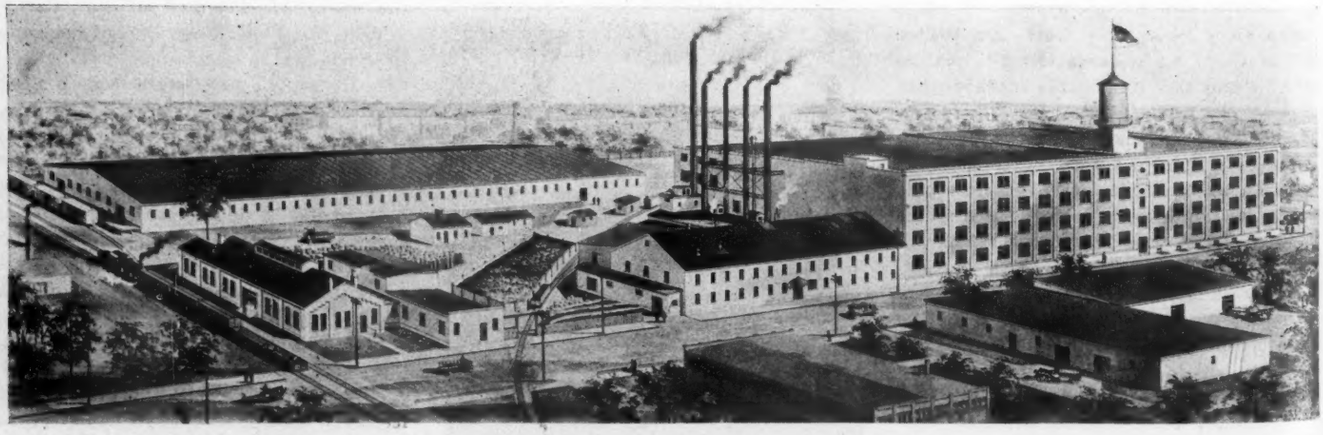
Langmaid Made Manager—Chase Langmaid, formerly manager of the Boston branch of the Hartford Rubber Company, has been appointed manager of the New England branch of the United States Tire Company that has taken over the four big tire companies, among them the Hartford. It is understood the new combination is now looking for a big building in Boston suitable for a salesroom where all four stores may be combined.

Buy Out Foreign Interests—It is reported that several men prominent in business and financial circles in Chicago and the east have purchased outright the patent rights of the Swiss Magneto Co. Among those interested are Joseph Ratzer, New York city; H. P. Smith and F. J. Wende, Chicago; B. B. Clarke, Madison, Wis., and M. B. Hauxhurst, Waukegan, Ill. The consideration involved in this is said to be $100,000. This company has been manufacturing in its Chicago factory for about a year the ignition device known as the Swiss high-tension magneto, and while for some time past entirely under control of American interests, the latter have been paying royalties to the foreign faction. This new arrangement removes the last vestige of foreign financial interest in the company. The management has contracted with the inventor for his services for a period of 10 years and will also retain the various foreign engineers who have been associated with him.

Velie Organizes in Maine—The Velie Motor Car Co. of Maine was organized this past week by C. W. Clifford, Jr., president and treasurer; John P. Goff, manager. Headquarters will be at Bath, Me., and the company will handle Velie cars throughout the state, appointing agencies.

Williams Succeeds Pierce—George Williams has been appointed general superintendent of the Pierce Motor Co., the motor car department of the J. I. Case Threshing Machine Co., of Racine, Wis., to succeed Andrew J. Pierce, founder of the concern and designer of the Pierce motor, who will retire from active business after 40 years of active participation. Mr. Williams came to the Pierce company from the Willys-Overland plant at Toledo last fall.

Battle of the Ballots—A voting contest for a king and queen for the decorated motor parade at night during the Indianapolis show week, February 28 to March 4, promises to be the greatest popularity contest ever held in that city. Prominent business men and social leaders among the women are in the race. The daily newspapers are publishing the coupons and the votes are leaping upward by the hundreds and thousands. This pageant will be held at night. John Orman, of the Premier company, is the chairman of this division. Among other features of this week's activities in honor of King Gasoline will be contests at the Indianapolis motor speedway which will be free to the visitors. A street traffic-drama promises to be both educational and entertaining. This will illustrate a busy street intersection and show the right and wrong way to handle pedestrians and vehicles. A banquet will be held on the last night. Will



AKRON PLANT IN WHICH FIRESTONE TIRE AND RUBBER CO. MAKES RIMS

and Dealers

H. Brown, vice-president of the Overland company, is chairman of the banquet committee. Separate displays and educational exhibits will be held in each of the forty-one retail stores, eighteen factories and twenty-seven garages.

Will Make Engines—The Ajax Auto Traction Co. has completed its factory at Kenton, Ore., and started active operations. It will manufacture four-cylinder gasoline traction engines, heavy-service motor trucks, marine gasoline engines, etc.

U. S. Motors Considering Des Moines—Horace De Lisser, vice-president of the United States Motor Co.; Fred E. Dayton, sales manager of the Columbia Motor Car Co.; Maurice Grabowsky, manager of the truck department of the United States Motor Co., and W. S. Hathaway, supervisor of western agencies, were in Des Moines Saturday and are making arrangements to establish a new house in Des Moines. The Iowa branch of the United States Motor Co. is known as the United Motors Des Moines Co. H. B. Groves is the Iowa manager.

Racine Would Keep Plant—If Racine capital comes forward and takes up the proposed additional issue of stock in the sum of $400,000 to be made by the Racine Mfg. Co. the big body plant will remain in that city. Business, commercial and civic organizations are bending every effort to have the issue subscribed, as the loss of the plant would be a serious blow to the Belle City. The Racine Mfg. Co. has been obliged to restrict its operations since the fire late in 1909 which destroyed the plant, and the net earnings of $300,000 for 1909 have fallen to $44,000 during the last 8 months because the total value of products was only $426,000 during the latter period. The company now has orders for $2,000,000 worth of goods on its books and finds it absolutely necessary to have more capital to take care of it. The factory is so good a business proposition that many other cities are bidding for it and the company feels obliged to leave Racine if it fails to get capital. The additional stock issue will enable it to double the plant in size and capacity and about 2,000 men will then be employed.

Wheel Company Flourishing—Offices of the recently organized Seaton Auto Spring Wheel Co. have been established in the Indiana Pythian building, Indianapolis, the factory being located in Lebanon. The company is said to have sufficient orders for the spring wheel invented by B. C. Seaton to keep the plant running night and day for 3 months. William B. Cooley, president of the Waverley Co., is among those interested in the wheel company.

Has New Tire Idea—A company is being organized in Indianapolis to manufacture a composition designed to make tires solid and yet retain their resiliency. Among those who will be interested in the company which will be incorporated with an authorized capitalization of $100,000 will be H. H. Symmes, R. J. Espey and J. D. Williams. The main factory will be located in Indianapolis, with branch plants at Fort Wayne, South Bend, Hammond, Lafayette, Marion, Richmond, Terre Haute, Bedford, Greensburg, Evansville and Jeffersonville.

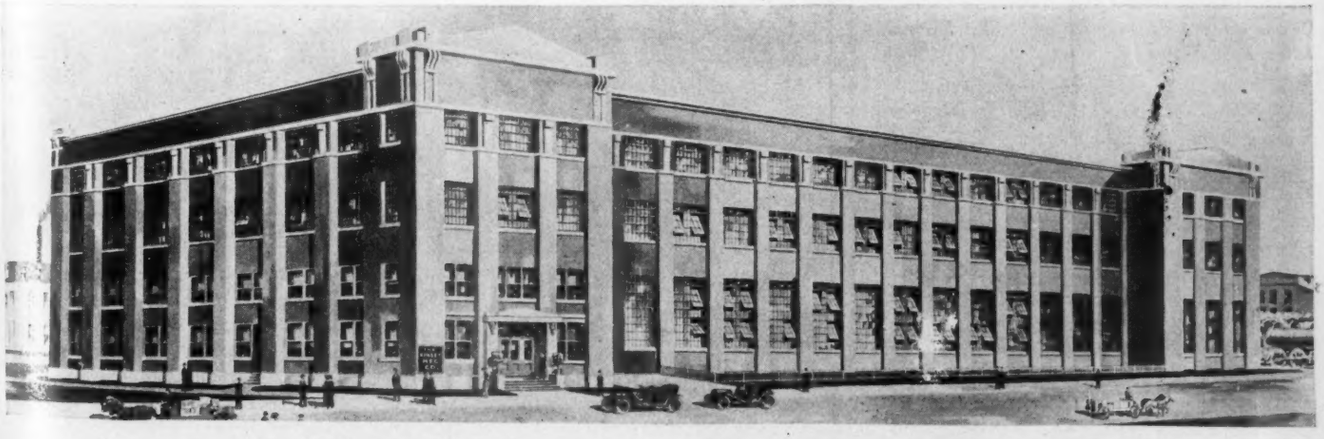
Choose New Officers—At the annual stockholders' meeting of the J. Ellwood Lee Co., held at the company's offices in Conshohocken recently, the following officers and board of directors were elected for the ensuing year: President and general manager, J. Ellwood Lee; vice-president, J. W. Johnson; secretary, A. R. Lewis; treasurer, C. A. McCormick; superintendent, S. Wright; board of directors, J. Ellwood Lee, J. W. Johnson, F. R. Jones, A. R. Lewis, Charles Heber Clark, J. Carl De La Cour, A. A. Garthwaite, S. Wright and M. O'B. Hallowell. The company has progressed so rapidly in the past

WHERE OMAHA BRANCH OF FISK RUBBER CO. IS LOCATED

year that it has built a new four-story plant, made of concrete. The capacity of the motor tire building will be 500 puncture-proof tires and 1,000 inner tubes per day, it is announced.

Still Marmon's St. Louis Agent—The Nordyke & Marmon Co. announces it has made no change in its St. Louis agency as reported in Motor Age. The Missouri Motor Car Co., 1131 Olive street, is the Marmon agent in the Mound City, not the Lane-Lynch Motor Car Co., as was reported in a recent issue of Motor Age.

Case Plant Growing—The J. I. Case Threshing Machine Co., of Racine, Wis., has been obliged to raise its limit of production, which was placed at 1,500 cars at the beginning of the season. The Pierce motor plant is now being enlarged by the addition of two more buildings, increasing the floor space by 25,000 square feet. The two additions are each 200 feet long and 62 feet wide, one story high. The company recently discontinued its motor boat and engine department in order to gain more floor space and facilities for the motor car department. A large assembling building was recently completed, which adds to the completeness of the plant.



PLANT OF THE KINSEY MFG. CO. AT TOLEDO, MAKING RADIATORS

Brief Business Announcements

OMAHA, NEB.—Jack Sharp has taken the agency for the Alco in this city.

Portland, Ore.—Herman Wittenberg, Jr., has recently taken the agency for the Otto car in Portland.

Cleveland, O.—The West Side Automobile Repair Co. has accepted the agency for the Power car, which is built in Cincinnati.

Boston, Mass.—Wallace L. Wilcox, who has taken on the Owen car in Boston, has managed to secure salesrooms at 823 Boylston street.

Montreal—The Canadian Automobile Co. has opened new quarters at 182 Peel street and will handle a line of cars, including the Pierce, Stearns, Cadillac and the E-M-F.

Boston, Mass.—W. A. Stiles has come to Boston to join the sales force of the F. R. Parker Co., handler of the Elmore. He was with Atwater Kent Mfg. Works, at Philadelphia, for the past 4 years.

Spokane, Wash.—The Regal Garage Co. of Spokane is having built at Pasco, Walla Walla, North Yakima, Wenatchee, Ellensburg, Wash., and other places concrete garages and equipping them with repair shops.

Massillon, O.—The Reliance Mfg. Co. has been incorporated with a capital of $10,000 to manufacture accessories and supplies by Frank C. McLain, M. R. Bissell, John Ingelstrom, J. E. McLain and F. W. Arnold.

Hartford, Wis.—Walters & Wittig have purchased two lots adjoining their garage on North Main street and will erect a large addition in the spring. The building will run from street to street, giving two main means of ingress and egress.

Boston, Mass.—A new company has been formed in Boston to handle the Atterbury truck, formerly handled by the Waite-Robbins Co. that failed. It is composed of E. R. Gould and Robert Seymour. They have opened temporary offices at 79 Milk street, but will secure salesrooms later on.

Warren, Pa.—The Pennsylvania Railway Motor Co., capital $200,000, has been formed by J. A. Biele, Frank M. Knapp, R. M. Brown, O. W. Ensworth, of Warren. It will equip a plant at once and will turn out at least one Biele motor car every month.

Columbus, O.—Engle & Vincent, who took over the sales rooms formerly occupied by the Curtin-Williams Automobile Co. at 133 Parsons avenue, has taken the central Ohio agency for the Paterson. Edward Miller, Ann street, has taken the central Ohio agency for the Premier. Fred W. Atcheson, 56 East May street, has been selected central Ohio representative for the Lexington car.

Kewaunee, Wis.—Dishmaker Brothers are new Ford agents here.

Portland, Ore.—F. A. Davis has recently secured the Winton six agency for southern Oregon.

Cleveland, O.—To accommodate its increased business the local branch of the Diamond Rubber Co. has removed to 2034 Euclid avenue.

Philadelphia, Pa.—The Automobile Supply Co., 1331 Vine street, has a new one, in that an all-night service for motorists has been established.

Boston, Mass.—The Henry is the latest to be added to the list in New England, having been taken on by McKinnon & Alexander. They are looking for salesrooms now.

Elwood City, Pa.—This city is negotiating with a leading motor car manufacturing concern now located in Michigan for the location of its plant, which will employ 100 men at the start. Three sites are offered.

McKeesport, Pa.—The chamber of commerce is trying hard to land a motor vehicle manufacturing plant that will employ 300 skilled mechanics. The company will require about 10 acres and is now located in Ohio.

Cleveland, O.—R. H. Eckenroth, of the Eckenroth Sales Co., has made arrangements to handle in this territory for 1911 the Wilcox lines of trucks, the Haynes touring car and the Inter-State line of pleasure vehicles.

Dayton, O.—The Multiple Jet Carbureter Co. has been chartered with a capital of $10,000 to manufacture carbureters and other accessories for motor cars by J. W. Raymond, Joseph Friedman, Mary C. Raymond, B. Sammelman and Abe Sammelman.

Nashville, Tenn.—The selling force of the Southern Motor Works, maker of the Marathon car, has recently been largely augmented. A. J. Dale is representing the company's interests in Tennessee, Alabama, Arkansas and Kentucky. H. D. Bright is covering the southeastern territory, and F. J. Delaney will cover part of the western territory.

Cleveland, O.—The Cleveland Regal Motor Sales Co. has been incorporated with a capital of $10,000. The incorporators are Harry L. Vance, C. I. McGowan, V. S. Sperry, B. R. Stevens and George P. Sperry. Formerly the Regal was handled in Cleveland by a direct branch house, with F. L. Pierce as manager. Pierce has been called to Detroit and will act as general sales manager for the Regal company. The new salesrooms will be located at Euclid avenue and East Twenty-first street.

Tacoma, Wash.—The Pacific Car Co. has taken the agency for the White truck.

Philadelphia, Pa.—Salesrooms for the Glide and the Avery have been established at 638 North Broad street.

Spokane, Wash.—D. H. Waters has secured the Oldsmobile agency for eastern Washington and northern Idaho, with headquarters at Spokane.

Seattle, Wash.—Alfred G. Ayerst has accepted the position of sales manager for the F. H. Barshar Co., distributors for the Stevens-Duryea and Marion cars.

Mount Sterling, O.—The Mount Sterling Motor Sales Co. has changed its name to the Sterling Motor Sales Co. Charles F. Nicker is president, and R. E. McKisson, secretary.

Wausau, Wis.—The L. H. Hall Automobile Co., a large agency, firm, and owner of the West Side garage, will erect a new garage, to include a large repair shop, in the spring. The building will be two stories high, with dimensions of 48 by 90 feet.

Bucyrus, O.—A new sales agency and garage will be erected by A. L. Holloway on a site leased from H. N. Oberlander on South Poplar street. The new building will be 80 feet long with a frontage of 50 feet. A repair shop will be one of the features of the garage.

Indianapolis, Ind.—The Central Automobile Co. has been formed in Indianapolis by George N. Carter, Frederick S. Chapman and Charles W. Sweet, and has succeeded the Williams Automobile Co. at 27 North Capitol avenue. In addition to doing a general garage and repair business, the company will have the agency for the Grabowsky power wagon.

Milwaukee, Wis.—The Winton Motor Car Co., of Cleveland, O., which recently was granted rights to operate in Wisconsin, has established a branch in Milwaukee. Headquarters have been opened at 188-190 Eighth street, in the Walsh garage, which is also the headquarters of the new Wisconsin branch of the Hearne Motor Co., of Chicago, Hupmobile agent.

Hartford, Wis.—The Northwest Kisselkar branch has been incorporated at Hartford, Wis., where the Kisselkar is made, with a capital stock of $20,000. The backers are all associated with the Kissel Motor Car Co. and include George A. Kissel, Otto P. Kissel and Paul A. Rix. It is expected that the company will take charge of the Kisselkar promotion in the Pacific northwest. The Kisselkar Co. of Milwaukee, Frank J. Edwards, president and general manager, now dis-

tributes the Kissel in the middle west, south, and southwest.

Milwaukee, Wis.—The Independent Oil and Grease Co. has increased its capital stock from $10,000 to $50,000.

Milwaukee, Wis.—The Lemke Electric Co., manufacturing storage batteries and ignition devices, has increased its capital stock from $2,000 to $10,000.

Milwaukee, Wis.—The Milwaukee Tire Repair Co., 457 Milwaukee street, agent for Republic tires, has increased its capital stock from $8,000 to $12,000.

Urbana, O.—John P. Adamson, of Columbus, has taken over the Only garage at Urbana. He has taken the agencies for the Brush and Sampson in Madison, Logan and Champaign counties.

Mount Gilead, O.—A company, to be known at the Mount Gilead Garage and Automobile Co., has just been organized and a two-story garage and repair shop is being constructed for its use on West Center street.

Neenah, Wis.—The Valvoline Oil Co. has completed its new oil warehouse and reservoir at Neenah, which is the headquarters for the central and northern Wisconsin territory. C. M. Douglas, of Madison, is manager.

Indianapolis, Ind.—The Archey-Atkins Co., of Indianapolis, has taken the agency for the Detroit electric, which has not been represented in this city heretofore. The same company also has the agency for the Pierce-Arrow.

Milwaukee, Wis.—J. C. Irwin, who recently established the state agency for the DeTamble Motors Co. at Madison, Wis., under the style of Monona Motor Car Co., has resigned to become state agent for the Warren Motor Co. of Detroit.

Marietta, O.—The Court Motor Car Co., recently incorporated under the laws of Ohio with a capital of $15,000, has been organized by the selection of T. L. Riddle, president; J. A. Lovell, vice-president; W. E. Sykes, secretary and treasurer, and H. J. Hinds, general manager.

Watertown, Wis.—William F. Copeland, president of the Copeland-Roach Motor Co. of Watertown, Wis., has been obliged to retire from the concern by the pressure of other business. His interest has been taken by J. A. Hayhurst. The company represents the Rambler and Mitchell.

Portland, Ore.—Chanslor & Lyon, one of the largest motor supply houses on the Pacific coast and operating stores in Seattle, Spokane, Los Angeles and San Francisco, the past week opened a branch in Portland. Phil Lyon, of San Francisco, will have charge of the new branch.

Minneapolis, Minn.—A. Zekman, connected with various Minneapolis business enterprises for the last 15 years, has acquired the northwestern distributing rights for Atterbury commercial vehicles and hereafter will sell these trucks and sight-seeing buses as manager of the Atterbury Motor Car Co. He has established an office at 807 South Sixth street.

Spokane, Wash.—Manager H. J. Banta of the Northwest Auto Supply Co. announces that during 1911 he will handle the Buick cars in Spokane and vicinity.

Des Moines, Ia.—The Standard Motor Car Co. is the name of a new concern which has opened at 908 Locust street. E. A. Kizer is manager. The firm will handle Paterson and Knox cars.

Boston, Mass.—The Parry is being handled in Boston once more, this being the third time it has been taken on by an agency. W. C. Wiggin of Ware has it now and he will open salesrooms shortly.

Cleveland, O.—J. A. Green, former chief clerk of the Baltimore and Ohio Railway Co., has taken the managership of a branch office of the Century Tire Co. of New York. The salesroom is at Euclid avenue and East Thirty-first street.

Cleveland, O.—The Stuyvesant Motor Car Co., of which Frank E. Stiversan is president; C. J. Castle, vice-president, and A. C. Newton, secretary and treasurer, will erect at once a plant to connect with the present plant on West Twenty-fifth street. The new building will have four stories. The company will build 400 cars this year, most of them of the Stuyvesant four-cylinder type.

Moscow, Idaho—G. F. Albright has been appointed Regal agent at Moscow and will handle Nez Perce and Latah counties.

Tomahawk, Wis.—James H. Ball has been appointed representative of the Lion in a large territory of northern Wisconsin.

Portland, Ore.—The B. F. Goodrich Co. has opened its Portland branch at 325-7 Burnside street, with C. J. Fitch in charge.

Cleveland, O.—T. E. Webb and B. E. Pedlow have organized the firm of Webb & Pedlow to handle the Jackson line in this territory.

Seattle, Wash.—The northwest factory branch of the Winton Motor Carriage Co. has closed an agency for its cars in Vancouver, B. C., with W. F. Silver & Sons.

Pittsburg, Pa.—The General Automobile Co. has moved into its garage at 5518 Walnut street, east end. This place was formerly occupied by the Mutual Motor Car Co., which moved February 1.

Dayton, O.—The Geyer Sales Co. has been incorporated with a capital of $75,000 to operate a sales agency and sell parts and accessories of motor cars by Carl F. Geyer, Frank C. Vail, J. Carl Horton, Harry S. Snyder and E. S. Carnes.

Boston, Mass.—Frank P. Anthony has taken the agency for the Imperial car for New England and he will make Boston his headquarters. He has not yet secured a location for salesrooms, but expects to get a place in a short time, before his demonstrating car arrives.

Cleveland, O.—The Wissman Auto Repair Co., of Cleveland, has been incorporated with an authorized capital of $5,000 to deal in motor cars and operate a garage and repair shop, by Joseph H. Wissman, Anna Wissman, Nettie L. Clomak, William J. Clomak, and Joseph C. Kocian.

Akron, O.—The Independent Rubber Co. has been chartered with a preliminary capital of $10,000 to manufacture and sell all kinds of rubber articles, including tires. The incorporators are S. G. Rogers, A. J. Rowley, Grace A. Sirderfield, Lloyd R. Read and R. H. Nesbitt.

Washington Court House, O. — The Swope Garage and Machine Co. has been incorporated with a capital of $10,000 to manufacture and deal in motor cars, parts and accessories. The incorporators are: George B. Swope, Elmer Junk, P. F. Ortman, C. V. Lanum and J. E. McLean.

Montreal—The Wilson Brothers' Motor Co., Ltd., has secured a supplementary letters patent changing its name to the Motor Import Co. of Canada, Limited. The company has the sole agency in Canada for the Thomas and the territory from Montreal to the Atlantic for the Franklin and Hudson. It also represents the Brush, Stoddard-Dayton and Knox.

Philadelphia, Pa. — Wilson Motor Starter Co., capital stock $30,000.

Boston, Mass.—Otto Sales Co., capital stock $25,000; incorporators, Roswell Linscott and E. S. Carpenter.

Cleveland, O.—Cleveland Regal Sales Co., capital stock $10,000; to sell Regal cars; incorporators, H. L. Lance, D. I. McGowan, V. S. Sperry, B. R. Stevens and G. P. Sperry.

Cleveland, O. — Mora Power Wagon Co., capital stock $750,000; incorporators, M. H. Nason, R. P. Abbey, T. S. Dunlap and H. A. Mullen.

Los Angeles, Cal.—Commercial Motor Co., capital stock $300,000; incorporators, W. A. Eckerly, R. W. Towne, E. A. Shinn, M. F. Bangs and E. J. Borgmeyer.

Los Angeles, Cal.—Pneumatic Clutch Motor Co., capital stock $250,000; incorporators, E. W. Murphy, J. G. Wartmann, C. M. Gair, J. H. de la Monte, E. Wilson, S. T. Kelsey and A. L. Stephens.

New York—Automobile Trade Exchange; capital stock, $50,000; deal in motor cars; incorporators, E. J. Scully, G. Mantani and M. F. Eagan.

New York—United States Tire Co.; capital stock, $500,000; to manufacture rubber goods, etc.; incorporators, H. C. Sawyer, S. Norris and E. J. Hathorne.

Rochester, N. Y.—Rochester Garage Co.; capital stock, $5,000; directors, Charles Garson, Charles Fulton and E. M. Strouss.

Rochester, N. Y.—J. M. Jones' Sons Co.; capital stock, $100,000; to manufacture railroad cars and motor vehicles; incorporators, J. H. Jones, J. B. McKeese and F. R. Jones.

St. Paul, Minn.—Aircraft and Auto Parts Mfg. Co.; capital stock, $24,500; incorporators, E. E. Roberts, F. W. Gordon and Frank S. Bradley.

Pittsburg, Pa.—Pennsylvania Sales Corporation; capital stock, $5,000; incorporators, W. J. Thubron, G. T. Ley and E. F. Gerber.

Pittsburg, Pa.—Wilson Motor Starter Co.; capital stock, $30,000; incorporators, John A. Wilson, W. Wilson and G. J. Sphrer.

Trenton, N. J.—Saurer Motor Co.; capital stock, $1,600,000; incorporators, Daniel W. Yeckley, H. B. Ranken and C. S. Fellows.

Trenton, N. J.—Arcade Garage and Machine Co.; capital stock, $10,000; incorporators, H. H. Samuel, Otto E. Wolf and L. W. Samuel.

Trenton, N. J.—Montgomery Garage Co.; capital stock, $125,000; to manufacture motor cars, motorcycles, etc.

Legal Lights and Side Lights

MASSACHUSETTS BILLS

MOTOR legislation will take up a good part of the time of the committee on roads and bridges in the Massachusetts legislature again this year, for there are a large number of bills to be heard. Some of them are duplicates on the light question that may be all heard at one hearing, and as they are very much alike it should be easy to settle upon some one of them. Those who have put in light bills are Charles Addison Malley, George E. Marchand, E. Wentworth Prescott,, the Automobile Legal Association, the Massachusetts State A. A., the National Automobile Association and the Massachusetts Automobile Operators' Association.

Mayor Fitzgerald, of Boston, has had several bills put in this year. One of these is designed to increase the maximum registration fee so that cars may be taxed as high as $50. The minimum is left at $5, and under the bill the entire scale may be rearranged by the highway commission. There is another one of the mayor's bills designed to increase the fees in which both commercial and pleasure vehicles are included. This calls for increasing the registration of commercial vehicles from $5 to $25, irrespective of horsepower. It also proposes to have all cars above 50 horsepower registered at a fee of not less than $25 nor more than $50.

There is more merit in some of the other bills presented by the mayor. By one of these he seeks to have such portions of the park systems as are used by motorists placed under the care of the highway commission. A year ago the mayor sought to get a portion of the fees from motorists for the parks, but was unsuccessful. There are two others, one by which the funds from motorists are to be paid into the general fund of the commonwealth and shall become part of the general features revenue. The other repeals the section inconsistent with the above.

The Automobile Legal Association has put in some bills. One of these seeks to relieve the unjust penalties now in force whereby it is not left optional with a judge to impose a small fine. Another is designed to give not only motorists, but all persons charged with misdemeanors, the penalty for which is not more than $25, the opportunity to appear by counsel. Another one is on lights, and a fourth measure is designed to define "ways," so that motorists may not be compelled to slow down and blow horns at every little private driveway.

Francis Hurtubis, Jr., counsel for the National A. A., has been busying himself for some months upon motor measures which his association is backing. One measure is designed to place motor cars upon an equal plane with other vehicles using the highways. Under the law now if a motorist is traveling along and his car is injured through a defect in a highway he cannot recover because a motor car is not a vehicle within the meaning of the law at present upon the statute books.

The Massachusetts State A. A. is going to center its efforts upon having a bill passed relative to vehicles carrying lights at night. It was thought best to try to work along those lines rather than put in a lot of measures.

The highway commission has put in a couple of recommendations that will be passed. One of these allows the destroying of worthless records piling up. The other is designed to prevent a man who has been deprived of a license, or anyone not entitled to drive a car, from operating a machine when accompanied by a licensed operator. It perfects the present law.

Manager Chester I. Campbell, of the Boston Automobile Dealers' Association, has put in a bill designed to allow the street commissioners to arrange for various sections of Atlantic avenue into a thoroughfare for motor trucks.

POLICE ARE INTERESTED

Representative ApMadoc, of Chicago, has introduced into the Illinois legislature a bill which, it is declared, places a premium on the heads of motorists. The bill pertains particularly to Chicago, and specifies that a percentage of the fines collected shall go into the police pension fund. This includes the policemen working for the park commissioners. Naturally, it is contended, this will make every bluecoat exceedingly zealous and the pension fund will benefit by every arrest.

LOOKING AFTER R. F. D. MEN

That the roads must be kept good for Uncle Sam's rural letters carriers, is mentioned in a good roads bill introduced into the Nebraska legislature. The bill would give the road overseers power to order out any able bodied man, his team and implements in order to make the roads passable for the carriers. It provides for a fine of $10 for each man refusing to respond to the call of the overseer, who in turn is compelled to start clearing the road whenever notified by a postmaster or rural carrier. The representative introducing the bill says that the reason for it is that the postoffice department has ordered that when a road is blocked by snow or for any other reason the rural mail carrier's trips will cease until the highway is again fit to traverse.

HIGH GRADE STEELS

SOME OHIO PROPOSITIONS

Three proposed laws pertaining to motoring have been introduced in the Ohio legislature which are as follows: Senate bill No. 54, by Senator Colton, of Montgomery county, prohibiting minors under 17 years of age from operating motor vehicles and imposing fines of from $25 to $50 for each violation. House bill No. 8, by Representative Sawicki, of Cuyahoga county, correcting an unauthorized alteration in the present law by the state codifying commissioner. This bill provides that in case of an accident occurring, the operator of the motor vehicle shall stop, and if requested shall give his name and address. House bill No. 182, by Representative Behne, of Williams county, is of especial interest to motorists, as it provides that in case an owner sells his car and acquires another within 30 days he may file a description of the new car accompanied by a fee of $1 with the secretary of state and be permitted to use the same number plates that were issued for his first car.

DELAWARE LAW-MAKING

Joy rides will be a thing of the past in Delaware, in the near future, provided the state legislature passes a bill introduced by Senator Drexler, of Sussex county, one feature of which is to punish persons who tamper with motor cars, or use them without the consent of the owners. The penalty for doing this is made $100 fine or imprisonment for a year, or both, at the discretion of the court.

Senator Drexler has given notice of a bill to increase the speed limit on rural roads in Delaware from 20 to 24 miles an hour, to make it conform to the Maryland and Pennsylvania laws.

A graded schedule for licenses, based on the horsepower of the cars, is provided for in a bill now before the Delaware legislature, which was introduced by Representative Evans. It does not, however, propose any increase in the amount of the license. Under this bill the total amount received by the state would be about the same as at present. The bill also stipulates that all of the money received from licenses shall be used for the improvement of highways, which will net at least $20,000 a year now, with a gradual annual increase.